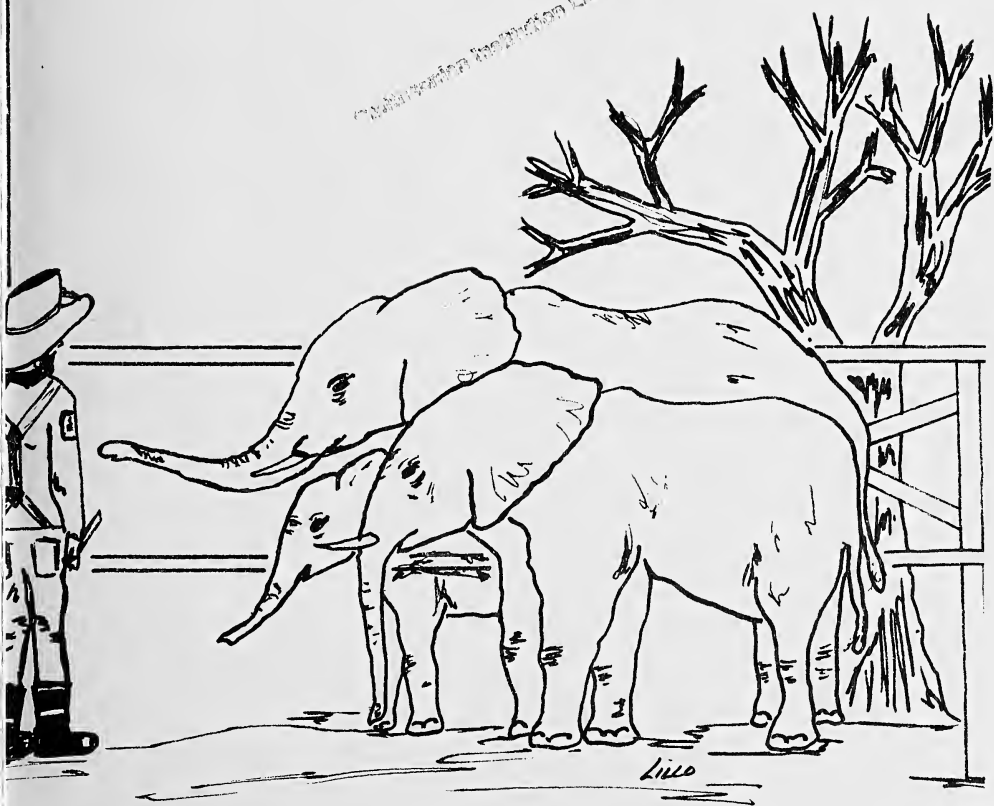


JANUARY 1983

Animal Keepers' Forum

Published by the American Association of
Animal Care



Dedicated to Professional Animal Care

Special Issue - Third Annual Elephant Conference

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Connie Cloak
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614	President
Jill Grade, Busch Gardens, Tampa, FL 33612	Vice-President
Mike Maybry, Memphis Zoological Park, Memphis, TN 38112	
Steve Taylor, Louisville Zoological Gardens, Louisville, KY 40213	
Kevin Conway, NZP/Conservation&Research Center, Front Royal, VA 22630	

COMMITTEE CHAIRMEN

<u>Awards Committee</u>	<u>Historical Committee</u>
Mike Crocker, Dickerson Park Zoo	Larry Sammarco, Lincoln Park
<u>Nominations and Elections Committee</u>	<u>Research Grants Committee</u>
Mike Maybry, Memphis Zoo	Frank Kohn, Audubon Park

PROJECT HEADS

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
Patti Kuntzmann, Philadelphia Zoo	Randy Adolph, St. Louis Zoo
<u>Keeper Data Survey</u>	<u>Infant Development Project</u>
Dave Orndorff & Mary Slaybaugh	Steve Taylor, Louisville Zoo
<u>Legislative Information</u>	<u>Keepers' Accomodation List</u>
Kevin Conway, NZP/CRC, VA	Chris Parker, Metro Toronto Zoo, Ont.
<u>Animal Data Transfer Forms</u>	<u>Book Reviews/Information Center</u>
Bernard Feldman, Miller Zoo, IL	Ellen Leach, Woodland Park Zoo, WA

Program Library

Mike Crocker, Dickerson Park Zoo, Springfield, MO

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director	
Ed Roberts	Walter D. Stone Zoo
vacancy	ME, VT, NH, MA, RI, CT
vacancy	NY
Kevin Conway	PA, NJ, MD, DE
Randy McGill	VA, WV
Lynne Villers	MI
Larry Sammarco	IN, OH, KT
vacancy	WI, IL, MO, MN, IA
Alan Sharples	TN, NC, SC
Dee Nelson	FL, AL, GA
Candy Kroft	AR, MS, LA
Laurence Gledhill	TX, NM, CO, OK, KS, NE, SD, ND
Joan Stinson	WA, OR, ID, MT, WY, AK
Vanessa Phelan	CA, NV, AZ, UT, HI
	CANADA

This month's Keeper/Artist is Gary Lillo, a keeper at the Topeka Zoological Park, Topeka, KS. Those who attended the Third Annual Elephant Seminar will no doubt recognize Gary's depiction of the Dickerson Park Zoo's Asian elephants and keeper Terry Letterman. Thanks, Gary!

Scoops and Scuttlebutt

FROM THE EDITOR'S DESK

In this special issue of Animal Keepers' Forum, we are pleased to bring you many of the fine papers that were presented at the Third Annual Elephant Conference held in October at Dickerson Park Zoo in Springfield, MO. The Conference was a unique blending of zoological personnel, circus people and independent elephant trainers and offered much for all those in attendance. Dickerson Park and its staff is to be commended for the fine job they did in hosting this event.

Two of the papers presented at the Elephant Conference were also presented at the 1982 AAZK National Conference in Toronto. These were: "The Elephant Management Program at Woodland Park Zoo" by Ellen Leach; and "Birth and Rearing of Elephas Maximus" by Jean Hromadka of Miami Metrozoo. Because they were published in the December Conference issue of AKF, they are not included here. For those individuals who were not members as of 31 November 1982, and thus would have not received the Conference issue, you may receive a copy of these two papers by sending a stamped, self-addressed envelope to: "Elephant Papers", c/o Animal Keepers' Forum, 635 Gage Blvd., Topeka, KS 66606. Please use legal-sized envelope.

Seven papers presented at the Elephant Conference did not arrive at our editorial offices in time for inclusion in this special issue. We will plan to include them under the "Elephant Set" column in upcoming issues of AKF as they become available.

GRANTS COMMITTEE CHANGES ANNOUNCED

Frank B. Kohn, Audubon Park Zoo, has replaced Mike Coker, Topeka Zoo, as chairman of the Research Grants Committee. All individuals interested in applying for research grants for 1983 are asked to direct their inquiries to Frank at Audubon Park, Box 4327, New Orleans, LA 70118.

NEW AAZK BOARD MEMBER NAMED

Steve Taylor, Louisville Zoological Gardens, has been appointed to complete the Board term left vacant by the resignation of Mike Coker. Steve has also been appointed to head the Infant Development Committee for AAZK. Mike will remain active with National Office affairs and in handling the various AAZK publications

Births & Hatchings

WOODLAND PARK ZOOLOGICAL GARDENS.....Mary Bennett

The following are the births and hatchings for June through September of 1982:

JUNE: 0.0.7 Satyr tragopan, 0.0.1 Snowy owl, 1.1.0 Welsh pony, 3.1.0 Angolan Springbok, 0.0.5 Common pintail, 0.0.5 Egyptian goose, 0.0.18 Wood duck, 1.1 Belgian draft horse, 0.0.2 African crested porcupine, 0.0.3 Bufflehead, 1.0 Barrow's Goldeneye, 0.0.1 Black and white colobus, 0.0.1 Red patas, 0.0.1 Humboldt's penguin, 0.1 Mountain goat, 0.0.6 Common guineafowl, 0.1 Olympic elk, 0.0.2 Sand cat.

JULY: 1.0 Sika deer, 0.0.1 Satyr tragopan, 1.2 Olympic elk, 1.0 Potoroo, 0.0.7 Wood duck, 0.0.1 Small-billed tinamou, 2.2 African lion, 1.1 Red panda, 0.0.2 Red-vented bulbul, 1.0.1 Cotton top tamarin, 1.0 Pygmy marmoset, 0.0.4 Rhea, 0.0.5 Ringed teal, 0.0.11 Monk parakeets, 0.0.1 Patagonian cavy.

AUGUST: 0.0.1 Red-crested touraco, 0.1 Reticulated giraffe, 0.0.2 Berlandier's tortoise, 0.0.1 Colobus, 0.0.4 Pygmy marmoset, 0.0.1 Palawan peacock pheasant, 0.1 Potoroo.

SEPTEMBER: 0.0.1 Small-billed tinamou, 0.0.2 Lesser galago, 0.0.1 Wallaroo, 0.0.1 Nicobar pigeon, 0.0.1 Squirrel monkey, 0.1 American bison, 0.0.2 African crested porcupine.

BROOKFIELD ZOO.....John S. Stoddard

November 1982 births and hatchings include: 0.0.1 Purple honeycreeper, 0.0.2 Blue-grey tanager, 0.0.3 Spiny mouse, 0.0.3 White-footed mouse, 0.0.13 White-toothed shrew, 0.0.2 Goeldi's marmoset, 0.0.1 Brush-tailed rat kangaroo and 0.0.1 Hairly-nosed wombat.

DALLAS ZOO.....Mary Beth Lasher

Births and hatchings for November 1982 are: 1.0 Patas monkey, 1.2 Servals, 1.0 DeBrazza's monkey, 0.1 Hamadryas baboon (DNS), 1.0 Axis deer (DNS), 1 Gouldian finch and 2 Jandaya conure.

BRONX ZOO.....Margaret Price

Included in the November 1982 additions at Bronx Zoo are: Mammals - 2 Axis deer, 1 Blackbuck, 1 Malayan mouse deer, 2 Acouchi, 2 Sambar, 4 African spotted grass mouse and 3 Patagonian cavy; Birds - 1 Silver gull and 4 Long-tailed grass finch; Reptiles - 4 Sinaloan milksnake, 5 Boa constrictor, 3 Burmese python, 1 Reticulated python, 1 Wood turtle, 1 New Jersey red-bellied terrapin, 1 Eastern box turtle, 1 Gulf Coast box turtle and 16 Red spitting cobra.



Coming Events

THE DR. BARBARA SAWYER MEMORIAL WILDLIFE CONFERENCE

February 4-6, 1983

San Francisco, CA

Topics to be covered include: captive breeding, rehabilitation, handling techniques, housing, nutrition, veterinary techniques, infant care etc. For further information contact: Nancy Venizelos, San Francisco Zoological Gardens, Sloat Blvd. at the Pacific Ocean, San Francisco, CA 94132.

SYMPOSIUM ON BREEDING BIRDS IN CAPTIVITY

February 24-27, 1983

Universal City, CA

Sponsored by the International Foundation for the Conservation of Birds in honor of Dr. Jean Delacour at the Sheraton-Universal Hotel. For information and registration forms, contact Gary Schulman, Delacour/IFCB Symposium, 11300 Weddington St., North Hollywood, CA 91601.

AAZPA WESTERN REGIONAL CONFERENCE

March 6-8, 1983

Santa Barbara, CA

Sponsored by the Santa Barbara Zoo. On 9 March, a post-conference whale watching trip is planned. Space on the boats is limited, so register early. For further information and registration forms, contact: Susan Engfer, Santa Barbara Zoo, 500 Ninos Drive, Santa Barbara, CA 93103. (805)962-5339.

AAZPA SOUTHERN REGIONAL CONFERENCE

March 20-22, 1983

Memphis, TN

Call For Papers: We cordially invite you to submit a paper for presentation. Papers covering all aspects of zoo biology are solicited. Please submit outline or abstract as soon as possible to: Charles Wilson, Memphis Zoo and Aquarium, 2000 Galloway Ave., Memphis, TN 38112.

AAZPA CENTRAL REGIONAL CONFERENCE

March 27-29, 1983

Albuquerque, NM

GREAT LAKES AAZPA REGIONAL CONFERENCE

April 10-12, 1983

Evansville, IN

Call for Papers: All AAZPA members interested in presenting a paper at the Conference to be held at Mesker Park Zoo should contact Mark S. Rich, Director, Mesker Park Zoo, Bement Ave., Evansville, IN 47712.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 24-26, 1983

Pittsburgh, PA

Call for Papers: if you are interested in presenting either a paper or a film (in-house productions), please send an outline or abstract as soon as possible to Regina Greeb, c/o The Pittsburgh Zoo, Box 5250, Pittsburgh, PA 15206. All keepers are welcome and encouraged to attend.

CONTINUING KEEPER EDUCATION

*By Judie Steenberg, Coordinator
AAZK Education Committee*

The Education Committee report in the November issue of AKF covered the results of the Toronto Conference, and identified three projects that Committee members will be working on in the coming year. This article will expand on those projects.

Review of Existing Training Manuals:

Good news for Chris Parker, but bad news for AAZK is that he will not be able to serve as coordinator of this project after mid-January. Chris will be off traveling for a year or more. Until another coordinator is appointed, please direct suggestions, ideas, materials and/or offers of help to Judie Steenberg, Woodland Park Zoological Gardens, Seattle, WA.

The first task in reviewing existing training manuals is to acquire copies. All AAZPA member zoos have a copy of the AAZPA Animal Husbandry Manual, and this is our starting point. Committee members have been asked to review their zoo's copy. As soon as the Metro Toronto Keeper Training Manual is off the press, we will be acquiring a copy of it to circulate for review. A third program we want to look at is the Animal Management program which is offered as a correspondence course from England. The committee would also like to learn more about Calgary's training program. As other programs are identified, printed materials will be obtained and reviewed.

The AAZPA Manual will be reviewed with the objective of determining what supplements AAZK could produce that would help a zoo put together an in-house training program suitable to its own needs.

The Animal Management course has the drawback that it is not possible at this time to test on the course in the U.S., and receive certification. In addition to reviewing the course and reporting on it in AKF for general membership information, an effort is being made to determine how U.S. keepers could write the test and be certified.

The Metro Toronto Zoo Keepers Manual was written by Chris Parker over a six month period on a bursary from the Zoological Society. A review of this manual will help identify how it might be adapted for use in other zoos.

The Calgary Zoo's training program requires that certain levels of proficiency be attained before a trainee moves on. A careful review of the program could help provide the ground work for writing a general program for the basic keeper. This could also serve as a review for veteran keepers, and a means by which we could determine our own proficiency as keepers.

The Committee does not intend to come up with a master manual from reviewing current manuals and programs. What we hope to accomplish is to determine how published materials might be put to use for you and your zoo.

There are two ways that you can help:

CONTINUING KEEPER EDUCATION, Continued

1. If you are using printed materials in a keeper training program, other than those already mentioned, please let us know so copies can be requested.
2. If you have suggestions, ideas or are interested in "working" on this project, write...now!

Keeper Safety Video Tape & Publication:

The second area of the Committee involvement is the production of a video tape on Basic Keeper Safety. It will be used as a supplement to the AAZPA Animal Husbandry Manual. This is a pilot project which will include a reference search and the publication of a pamphlet on Zoo Keeper Safety. The tape will focus on general keeper safety with an emphasis on safety as an attitude that benefits the animals as well as the keepers.

The reference search will identify hand-outs, films and existing literature that might be acquired as part of your training programs. Contact Wayne Buchanan, Woodland Park Zoological Gardens with any information you feel would be useful.

General Reference Search:

The third project is a reference search on Zoo animal management literature. This could result in a manual identifying basic reference materials, bibliographies, indexes, projects, organizations, Keeper exchange data, etc. - a central reference for Zoo Keepers. This is an ambitious task and it will take time to determine the best way to use the information that will be collected. Jenny Rentfrow, 1951 Eden Road, Mason, MI 48854 and Liz MacLaughlin, Roger Williams Zoo are co-coordinators of this project.

If you have a bibliography on a particular species that might be useful, please send a copy to Jenny or Liz for their review.

These projects will need input from the AAZK membership and hard-working Committee members to bring about results in the coming year. By working together we can accomplish a lot.

Finally, the Committee will make every effort to lend support and give assistance to existing AAZK committees and projects. To begin with, Mike Coker is in need of data for the Gestation Booklet project. The booklet is primarily concerned with collection of data on exotic animals in captivity. The data needed: gestation (days), litter size, breeding season, age of sexual maturity. Mike needs data on rodents, ungulates, carnivora and bats, especially. Start reviewing your records on species which have reproduced in your zoos and send the data to: Mike Coker, Gestation Project, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.



Keeper's Alert

The Animal Extinctions Symposium held in September at the National Zoo (July 1982 AKF, p. 156) was such a success that organizer Dr. Robert J. Hoage hopes to host similar symposia on a regular basis. Tentative subject for next spring: Animal Intelligence. AKF will pass the word when and if proceedings of the extinctions symposium become available.



ELEPHANT CARE AT SEDGWICK COUNTY ZOO

By
Terry Lincoln, Keeper
Sedgwick County Zoo, Wichita, KS

We have two elephants at the Zoo, both African females approaching twelve years of age. In the last few years, we've become increasingly aware of the care and attention that they need. This attention ranges from foot and skin care to constant updating of our techniques and commands. We realize that we are not experts in the field of elephant handling, so we are always looking at how others do things. Most of the commands and techniques that we use have been borrowed from other zoos and people who have more experience in the field than we.

We have certain guidelines which we follow when having contact with the elephants. There must always be at least two people present when working the elephants. We presently have five people who work with the elephants on a regular basis. Four of these are keepers from the African Veldt while the fifth is our General Curator. The Zoo also has three relief keepers who occasionally must have some contact with the elephants. This contact is limited to basic routines such as cleaning, feeding and chaining. We feel that this limited contact is necessary because of the inability for the relief keepers to regularly work with the elephants due to scheduling and the like. Whenever we have probable contact with the elephants, we carry an ankus (elephant hook). We realize that the ankus is a tool, not a weapon, and try to use it correctly.

Presently we chain our elephants by one front leg, alternating the legs by chaining the right legs on even dates and the left on odd dates. We are planning in the near future to begin chaining them by a rear leg as well as the front for certain routines we must perform around the elephants where a greater restriction of their movement is desired. The elephants are chained during the night and remain unchained during the day.

Our elephants are bathed every morning before being put on exhibit. This procedure includes hosing and scrubbing feces from their bodies, brushing and filing dead skin from their backs and trimming and filing of pads and nails. We've had good results with the use of hoofknives and rasps on their pads. We find it more desirable to trim a little bit each day than to perform a lengthy session less frequently.

In the past we've experienced a problem with a shortage of time since our veterinarian was part-time. His visits were made when medical attention was needed. The elephants learned to associate the veterinarian with a painful experience and consequently were very nervous during these visits. Now we have a full-time veterinarian who has time to spend visiting the elephants every week. During these visits he pats and talks to the elephants, allowing them to get used to his presence. We've just begun something else associated with veterinary care for the elephants. We are taking quarterly measurements of the elephants' height, girth, pad circumference and tusk length. This information will provide the veterinarian with reliable information and is surely interesting to us as handlers.

ELEPHANT CARE AT SEDGWICK COUNTY ZOO, Continued

Besides the bathing routine in the morning, we also conduct an afternoon obedience training session. Although only the five regular handlers are allowed to actively take part in this routine, other keepers are encouraged to observe this routine and/or talk to the public about the "whys and what fors" of elephant care. Our elephants are currently responding to about thirty vocal commands. Most of these commands have been introduced in the last two years or so. We are certainly searching for and adding new commands to vary the routine and further stimulate the elephants. It seems that our elephants have an unlimited capacity for learning new commands. We use positive reinforcement when working the elephants. We feel that positive reinforcement motivates the elephants to continually respond correctly. This reinforcement consists of praise in a pleasant tone of voice and affection by petting. If the elephant fails to respond to a command or responds incorrectly, vocal reprimands are given. If the disobedience persists, discipline may be necessary.

When working the elephants we always try to have a third person present to educate the public about our motives and to answer questions. Major points presented are the safety needs for keeper dominance, veterinarian inspections, the stimulus offered to captive intelligent animals, and the natural history of elephants. We try never to discipline the elephants in public view without explaining the reason for the punishment.

We still have a long way to go with our elephant care and handling. We have plans for the future to continue in our addition of new commands. We are gradually acclimating the elephants to taking regular blood samples so that estrus cycles may be determined. We are working to provide the public with graphics concerning the philosophy and various aspects of captive elephant management. By anticipating the needs of and changes in our elephants, we can hopefully adjust ourselves and/or routines in such a way as to avoid any problems which otherwise could arise.

Outline of Elephant Care Program

*Compiled by Ken Redman, General Curator, and Keepers
Steve Kingswood, Terry Lincoln, Michelle Thudium and
Scott Carter -- Sedgwick County Zoo.*

- I. In order to clarify procedures for all Zoo personnel having any contact with the elephants, the following general policies have been adopted:
 - A. Veldt Keepers & Staff -- All persons having necessary or probable contact with the elephants must be authorized. A person may become authorized by understanding this written guideline and its application through daily practice and experience. Authorized keepers must demonstrate competence regarding daily management and control of the elephants. New keepers learn the basics of captive elephant management through a process of observation and experience under supervision. For safety purposes, no one should ever be in the exhibit with the elephants unless a second person is within sight, preferably another authorized person.
 - B. Relief Keepers -- Due to difficulties with scheduling and, consequently, the inability of relief keepers to work with the elephants regularly, it is necessary to limit the contact between the elephants and relief keepers. Because of the lack of continuity with elephants, relief keepers are excluded from handling the elephants during the training routines. The mechanical aspects of elephant care such as chaining, cleaning and feeding may be handled by relief keepers but even these activities require periodic contact with the elephants to maintain authorization.

ELEPHANT CARE AT SEDGWICK COUNTY ZOO, Continued

- D. Other Zoo Personnel and Visitors -- All non-public areas of the Veldt are off-limits to other Zoo personnel unless permission is obtained from the staff and they are accompanied by an authorized person. This is for their own safety, as they may not be aware of the great agility or potential danger of these animals. All visitors of Zoo personnel or educational groups must have permission from the staff to enter the non-public areas of the Veldt Building. An authorized person should be notified beforehand so that the area can be prepared and the time made available.
- D. What Should Always Be Done
1. When entering the exhibit area or even when in probable contact, the ankus (elephant hook) must always be carried. An authorized person should know the proper utilization of the hook, as it is only an aid to one's dominance and should never be used as a weapon.
 2. Always announce yourself loudly and clearly before approaching or entering the exhibit areas. Familiarity with the elephants' normal disposition is necessary in order to recognize unsafe situations that may arise due to excitement or stress.
 3. Always move carefully and naturally when around the elephants.
 4. Use the elephant's names to establish a bond.
 5. Always let the elephant know exactly where you are and always know exactly where they are. Give them your undivided attention. Be alert and be aware of every movement.
 6. Always try to be calm and confident. If you are nervous, tense and unsure of yourself you are in an unsafe position.
- E. What Should Never Be Done
1. Never enter the enclosure unless certain that the elephants are in a calm and manageable state.
 2. Never let the elephants crowd you against the walls, bars, each other, etc. Instead, move them by vocal or hook commands.
 3. Never leave tools, buckets, hoes, etc. unattended. Not only can the animals destroy these things quickly, but possibly ingest broken items or incidentally hit you or the public with them.
 4. Never discipline the elephants in public view without explaining the reason for the punishment.

II. Daily Care

- A. Chaining Procedures -- When chaining, the following schedule is to be practiced: right foot on even-numbered calendar days, left foot on odd-numbered calendar days. Upon the command PICK IT UP, the elephant should pick up the chain and upon the command HERE, she should present the chain to you. The command CHAIN FOOT should be given, with the elephant always lifting the trunk as well as the appropriate foot. The elephant should continue holding the trunk and foot up until released. Two extra sets of chains (one with brummel hooks at both ends) should be readily available should the ones being used break.

ELEPHANT CARE AT SEDGWICK COUNTY ZOO, Continued

- B. Foot and Skin Care -- The elephants are to be bathed every morning after their pen has been cleaned of all feces. This routine will vary, but a general procedure to follow is: hose the elephant down thoroughly having them TURN and TRUNK UP. Then, using a footstool for support, have her lift her feet one at a time and trim pads and/or file nails with appropriate tools (currently hoof knife and rasp). Next the elephant should be made to COME STRETCH and LAY OVER. Brushes may be used on the elephant's back to remove some of the dead skin. The elephant should then be made to COME UP. The elephants are then unchained and put on exhibit. The application of Hooflextm (used to moisten the nails to help control cracking), filing nails and removing dead skin from the elephants' backs are usually the only activities directly related to foot and skin care done during the afternoon training session (described later).
- C. Veterinary Inspections and Measurements -- The veterinarian should visit the elephants at least once a week so that they become used to him and do not become overly excited during inspections. During these visits, it is suggested that the veterinarian check different parts of the elephants so that they become used to being handled in this way. To provide the veterinarian with reliable information and to accurately monitor the elephants' growth, the following measurements should be taken quarterly (the first day of January, April, July and October): girth at heart, height at shoulder, pad circumference and tusk length.
- D. Weather and Exhibit Conditions -- Weather and exhibit conditions are daily considerations when deciding to put the elephants outside or not. The minimum temperature the elephants can comfortably tolerate is approximately 40°F., but when overcast or windy this temperature should be raised to account for these conditions. Slippery conditions resulting from mud, ice or snow should be avoided as they provide footing problems for the elephants. For public convenience, the elephants should be kept inside during periods of extended rain.

III. Obedience Training Sessions

- A. Who, When and Where -- At least two authorized persons (with the addition of a third person to talk to the public) should be present. Optimally, it should be possible to work the elephants at any time of the day; (indeed, the time of this routine is occasionally changed to account for tours, schedules and the like) yet on a regular daily basis training occurs from 2:30 to 3:00 p.m.
- B. Procedures and Commands -- Prior to entering the elephant exhibit, a brief discussion should cover the current status, any special plans or extra work for that day. Several seconds should be sufficient for the elephants to greet individuals present for training. With the exception of always starting and stopping with LINE UP and SALUTE, the order of the following commands is flexible.
1. RELAX -- calm down
 2. HOLD STEADY -- stay where you are
 3. COME TO ME -- move to keeper
 4. BACK OFF -- move away from keeper
 5. FOOT -- raise foot
 6. PAD -- present pad of foot to keeper

ELEPHANT CARE AT SEDGWICK COUNTY ZOO, Continued

7. CHAIN FOOT -- raise trunk and foot to be chained
8. HIGH -- raise trunk, foot, etc. higher
9. COME STRETCH -- go down square
10. LAY OVER -- from COME STRETCH position
11. COME UP -- from any position
12. ALL RIGHT -- release at end of specific command
13. SALUTE -- raise trunk, right front and left rear feet
14. THANK YOU -- releases animal completely
15. LINE UP -- side by side at specific place or position
16. PICK IT UP -- buckets, logs, chains, etc.
17. HERE -- present object picked up to keeper
18. DROP IT -- whatever they have
19. LEAD UP -- follow keeper
20. STOP -- usually from LEAD UP
21. NO -- no
22. TRUNK UP -- raise trunk and open mouth(showing teeth)
23. EASY -- slow down pace
24. MOVE IT -- speed up pace
25. TURN -- around (counterclockwise)
26. BACK UP -- move backwards in a straight line
27. LEFT FEET -- raise both left feet off the ground at the same time
28. RIGHT FEET -- raise both right feet off the ground at same time
29. GOOD GIRL -- not a release, but a reward

All commands should be audible to the elephants yet given with a minimum of repetition. If a command is ineffective, it should be repeated a little louder. If it's still ineffective, a sharp jab (avoid steady pressure) with the ankus should accompany the third attempt. Be sure the ankus is used only on fleshy parts of the elephant's body, never around the eyes, trunk or bony areas.

- C. Rewards and Discipline -- When the elephant performs commands well the trainer should offer praise in a pleasant tone of voice, calling it by name, using GOOD GIRL and affection by petting. Training by positive reinforcement will motivate the elephant to continually respond correctly. If the elephant fails to respond to a command or responds incorrectly, vocal reprimands should be given. If the disobedience persists, discipline may be necessary. A flake of alfalfa is given to each elephant after the routine as a way of saying "thank you for being good". Keeper judgement is very important in these training sessions. There is a fine line between too much discipline (hook shy) and not enough discipline (allowing disobedience). Each keeper should realize the dangers of going too far on each of these points. By staying aware of the changes which occur in our elephants, together with constant discussions with other elephant trainers, we can hopefully avoid many of the problems that occur in elephant handling.
- D. Talking with the Public -- Attempt to talk with the public about elephants and their management whenever possible. Always try to have a third person present during training sessions talking and answering questions. Major points to discuss are the safety needs for keeper dominance, veterinarian inspections, the stimulus offered to captive intelligent animals and the natural history of elephants.

ELEPHANT CARE AT SEDGWICK COUNTY ZOO, Continued

IV. Goals and Philosophy

A. Future Expectations

1. To add more commands and procedures for improved control and better care for the elephants. Immediate goals are to construct a large stand and a harness which will allow for numerous commands.
2. To have the ability to chain the elephants at any time, inside or outside, front and/or back legs.
3. To acclimate the elephants to taking regular blood samples so that estrus cycles can be determined.
4. To provide the public with graphics concerning the philosophy and various aspects of captive elephant management.
5. To produce a video program concerning captive elephant management for keeper and/or public education.

B. Philosophy of Keeping Elephants -- R.L. Blakley, SCZ Director

Keeping animals in captivity is one of man's oldest activities. It predates writing, schools, and other cultural activities. Today it serves some very definite and useful purposes. Zoos are far and away the most popular and heavily-attended cultural and public institutions. With their large audiences and the appeal of their exhibits, they can do a significant job of educating the general public. Since their exhibits are living and can breed, the zoo also can keep alive rare species that have literally been crowded out of their native habitats by encroaching human populations. Other functions which zoos can perform are recreation and scientific studies. These latter functions may be hard to measure, but they are also very important.

When one accepts the responsibility of a captive animal, one is morally and ethically bound to care for that animal in a thoroughly professional manner. The term "care" implies more than merely feeding and cleaning up after the animal. It means taking complete care of all the animal's needs, physical and mental. Taking a few minutes every day to socialize with the animal, if he enjoys it, is just as important as providing the right food.

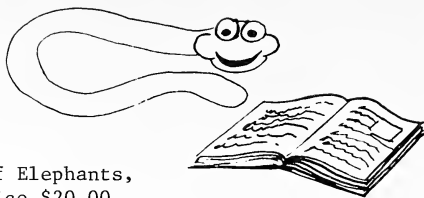
Elephants need more attention than most wild animals. The reason is twofold: they are very intelligent and they are highly social animals. The social structure of the elephant herd is very similar, in many respects, to our social structure. Because of these needs and their great size and strength, elephants are treated differently than most zoo animals. The constant handling and close contact that should exist between keeper and elephant make for a close emotional bond that is equalled only by that of a person and their pet dog.

The elephant keeper must not be blinded to the fact that, while the emotional bonds that he forms with his charges are important, an elephant "plays by different rules" than does the keeper. We do not know all that we should about elephant psychology. We do know that the keeper must become the herd leader and that this involves giving commands, discipline and affection and acquiring the animal's trust. We must cater to what they need (not necessarily what they want), and we must always remember that, while similar to us in many ways, they are governed by drives and impulses we, as yet, are only vaguely familiar with.

Elephants are potentially dangerous. The necessity for close keeper-elephant contact increases this danger. Elephants are elephants and people are people. This does not mean that one is "better" than the other, but it does mean they are different. We probably will never have all the answers. The really good elephant keeper keeps both his eyes and his mind open.



Book Review



Wild Elephants In Captivity

By Dr. Jack Adams

Published by Center for The Study of Elephants,
P.O. Box 4444, Carson, Ca 90749. Price \$20.00
plus postage and handling of \$4.65.

*Review by Michael Sutton
Vice Chairman, Association
of British Wild Animal Keepers
(ABWAK)*

'The Definitive Book on Elephants!' says the back cover, but is it? I, as a relatively green elephant keeper, am always on the look-out for good books on elephants and with this one thought that I had found THE ONE to teach me all I needed to know. After reading it I would disagree with the use of the word definitive.

Dr. Adams is a psychologist at California State University who became interested in elephants in 1971, during a trip to Africa, and has since devoted much of his time to studying them and founding the Center for the Study of Elephants on his campus. He has done anatomical and physiological work on living elephants and carcasses, but he is not an elephant handler.

Some chapters I found very useful, particularly--Anatomy & Physiology, Diseases & Abnormalities and The Care of Elephants. The chapter on Reproduction could, I thought, have been much bigger. It would certainly help the objectives of the Center if greater details of the successful and repeated breedings of Asian elephants at Washington Park Zoo, Portland, OR, were covered in greater detail to enable other establishments to emulate their success. There are several smaller chapters, viz. Elephant Persons, The Bull Hook, The Elephants, which were very interesting. Although seven sub-species of Asian elephant are listed, no mention of distinguishing characteristics are given but the author does say that they are difficult to ascertain. The existence of two sub-species of African elephant are noted, but again not the differences.

The two largest chapters are devoted to "A Tribute to Living Elephant Trainers and Handlers" and "Elephant Training". I should think that the former lists just about everyone in the U.S.A. who is training or presenting elephants, including eleven pages on "Smokey" Jones whose training methods form the basis for the other chapter. To read the former chapter, one would think that there are no trained elephants outside the U.S.A., there is no mention of any European trainers--no Chipperfields, Kossmeyers, Knies, etc. I quote - "In 1968 Smokey worked Judy, the water-skiing elephant at Marine World in Redwood City, California." I will not comment on this in case I am jumping to unjust conclusions, but refer the reader to "Zoovet" by David Taylor where a water-skiing elephant called "Herbie" is mentioned.

The chapter on training goes through four maneuvers - lying down, sitting, sitting on a tub, standing on hind legs. I consider that only the former is necessary for the regular keeping of elephants, the others are circus tricks. Obviously, a whole book could be written on training elephants alone; I would have preferred to have seen more of the basic skills taught, e.g. kneel, salute, tail (trunk) up, and even basic walking could have been covered. There is no diagram of the points where the hooks should and should not be used, a grave omission from a book that advocates their

(Continued on page 39)

To Satisfy Your Animal's Dietary Needs



INTERNATIONAL FOODS CO., INC.

*offers a full line of high quality and
nutritional prepared diets for your feeding program*

- **CARNIVORE DIET**

Quality conscious and high in protein.

- **BIRD OF PREY DIET**

Beef based and well formulated for complete nutrition.

- **PRIMATE DIETS**

Old World - 15% protein

New World - 25% protein

- **OMNIVORE DIET**

Specifically formulated for your omnivorous animals.

- **RATITE DIETS**

Starter/Grower (higher in protein and phosphorous)

Breeder/Adult (higher in calcium)

- **Also Available For Your Feeding Program**

Boneless Lean Beef and Beef Bones

INTERNATIONAL FOODS CO., INC. • P.O. Box 29345, Lincoln, NE 68529

Call Collect: (402) 466-8271

Telex: 484-369 CENCORP-LCN

ELEPHANT DIALOGUE...

By

*Betsy Bartholomay and Patricia Wiard
Keepers, Lincoln Park Zoo, Chicago, IL*



I'd like to talk to you about the elephant dialogue we use at Lincoln Park Zoo. On 21 October 1981, we acquired a three-year-old female African elephant from a culling in Kruger National Park. Binti, Swahili for Princess, came to us frightened and was very aggressive. Our Zoo Director, Dr. Fisher, had hired Don Meyer of the Elephant Management Program to train us and our elephant. The request for a trainer had come from our Curator of Mammals, Mark Rosenthal. Most regrettably, our careful videotaping of Binti's first days was stolen in a break-in of the Hoof Stock Building where Binti had been temporarily housed until the Large Mammal Complex was finished.

Those first days were a combination of earning Binti's trust and respect. Among the first dialogue words used were "quit" (stop), "hold" (freeze), "all right" (a release), and "come here". Obedience was rewarded with a treat when using a new command. After establishing that she understood the command, the treat for that command was stopped and a "thank you" or "good girl" was used.

Aggression (and there was a lot those first few weeks) was treated with an immediate reprimand. Elephant Management is teamwork, two people at all times. One ankus person is directly in charge of the elephants, and there is one mechanic for back-up, chaining, cleaning, and foot care. We even have a policy which results in a three-day suspension if any of us is in with the elephants alone or without an ankus.

Next in training came foot work---a series of presenting a "foot front" or a "foot pad" on front or hind legs. An important point to make here is that the words used for commands must be consistent. "Foot front" means just that, not foot up or down or anything else. No personalized variations are allowed; the commands stay the same for continuity. Because of this continuity, our second elephant, Bozie, an Asian female of seven, was able to be worked by us immediately when she came back from the Henry Vilas Zoo at Madison, WI.

Now for trunk work. A "trunk high"--trunk at forehead with tip curled over, and a "drop it"--trunk goes down and hangs relaxed. Extensions of the trunk work are: "Pick it up"--object is picked up. "Pick it up hold" object is held in tip of trunk slightly off floor/ground. "Pick it up high"--object is picked up and held at the forehead. And, of course, "drop it"--object and trunk are dropped and trunk hangs relaxed. These commands can be done in any type of sequence or with no sequence.

The next step was moving with the elephant which started with "lead up" cueing with the ankus behind the foreleg. The end result is that the elephant walks forward with the keeper at her shoulder at verbal command--"lead up". At this point, while presenting this paper with slides at the Toronto Conference, I pointed out that the slides used were from different areas and buildings at our zoo. We are very proud of the fact that our little elephant has been just about everywhere. Last June, Binti was walked from the Hoof Stock Building, at the south end of the zoo, to the new Large Mammal Complex at the north end. Binti had had been with us about eight months at the time this was done.

ELEPHANT DIALOGUE, *Continued*

Back to the dialogue. Next the command "come around", cueing with the ankus behind a foreleg and stepping left to make a left turn; and using "around", cueing behind the ear so the elephant turns away and makes a right turn with the ankus person. "Back" comes next with the ankus person standing directly in front of the elephant and cueing with ankus at the base of the trunk while saying "back". This is "come back" cued at chest with ankus person at shoulder stepping backward with the elephant. Next comes a "hold" which means freeze. The "lead out" extends the "lead up" by moving the elephant ahead of the ankus person.

Now back to some more foot work. The "split" is picking up diagonal feet, front and back, in a foot front and foot pad. This is an extension, putting together a "foot front" and a "foot pad". Next came a "brace" which is a "foot front" and "foot pad" on opposite sides. The command "change" can be used with the command "split" or "brace" or with individual front or hind feet. When "change" is called for, you will get the opposite foot or feet.

"Stand on it" is the extended behavior of the original "foot front" with our pedestal stand added. This pedestal was designed and made for us by Don Meyer. The pedestal stand is used for foot care/maintenance which is done daily using a rasp file in a rolling motion from the top of the nail to the bottom.

The "foot pad" extension (front or hind foot with toe nails resting on the stand) is solicited by the command "stand on it". In this position we can maintain the elephant's pads using a wooden plane set at a quarter-inch depth. This setting eliminates too much callous being taken off by an over-zealous keeper or nervous elephant.

A "salute" is achieved by combining a "foot front" on a foreleg with a "trunk high". This takes us into a "chain up", which is a "pick it up" "hold" with a bracelet "foot front" and gives us the "chain up". Another command is "come up" which would be used for loading our elephants for transport. An extension of "stand on it" with a "salute" added, makes use of the gunite rockwork in our outside yard.

In preparation for Bozie's coming home, we practiced "tail up" with a rope in front (slung over a keeper's shoulder) and a "tail up" behind (keeper holds elephant's tail). Because of the continuity of the Elephant Management Program we were instituting and that used by Herb Malzacher in training Bozie at Madison, we were, upon her arrival home, able to achieve a "tail up", "lead up" with our two elephants. Bozie had only been back about two weeks when we took her and Binti outside for the official ribbon cutting ceremony at the opening of the Large Mammal Complex. There were a few hundred people there and the girls broke the ribbon together using a "pick it up" and "trunk high".

Now I'd like to take you through our daily routine. It starts with everyone who is working the building that day saying good morning with hands on the elephants. The girls are in a "hold steady" before we enter the area.

In the holding area the elephants spend the night on two chains, placed diagonally. After greeting and watering, the floor is cleaned with the

ELEPHANT DIALOGUE, *Continued*

elephants picking up feet as needed. The baths begin with each being "stretched" (being down on knees and elbows). In this position we can scrub and hose the top part of our elephants, medicate backs and heads or draw blood from an ear as required. A second step to the "stretch" is the "lay over" on left or right side with legs extended. Bozie does this well and Binti is going to learn this winter.

Next comes foot care with Bozie. We use a rubber tub on the chained foot ("stand in it") leaving the loose foot free to "stand on it" using the pedestal stand. The tub is used in case we have to soak a foot or leg. At this point we pedicure feet as explained earlier. After footcare/maintenance is completed, we switch the front leg bracelet to the opposite leg. This is our guide to which foot stands "in it" or "on it" for the continuing pedicure work.

At this time, the girls would be moved into our indoor exhibit area in a "lead up", "tail up". Then they "break" (drop tail) and "line up". "Line up" is a predetermined place from which the elephants face the keeper entrance door. Now they are put on one foreleg chain using a "chain up". Then breakfast is given on exhibit. We check back later for a pick-up cleaning and feed lunch on exhibit. After our lunch, we take the girls into the outside yard using a "lead-up", "tail up" with ankus and mechanic people. We "break" the "tail up" for watering. Then they go to their outside line-up spot for chaining (using "chain up"), then are fed some hay. After some hands on and "good girls", we leave the yard.

Right now we are releasing them inside on exhibit for an hour or so off chains and we are increasing this time. They are allowed off chains inside because they know where their "line up" point is and they go to it on verbal command when the door is opened. We are going to establish a point at which both are visible from the yard door so they can be released into the outside yard also.

After their time off chains on exhibit, we do individual workouts, then "lead up", "tail up" into holding and after "chain up", dinner is fed and "good night".

The team concept continues with weekly meetings where open dialogue can sometimes bruise egos, but we have to be honest to have the continuity that makes the management program work. No new behaviors can be done without discussion and approval of the entire committee. At this point, we have four people who work on ankus with our elephants and there are two more who will be started soon.

In this short year we have spent with Binti we continually learned together, and what we strive for is to continue to have our elephants be healthy physically and mentally. I'd like to thank all the people who loaned me slides for this presentation and also thank the team--both two-legged and four-legged--who made this talk possible. Most of all I'd like to thank Herb Malzacher for all his hard work with Bozie and Don Meyer who has our unending trust and respect for a management program that works.

I'd like to leave you with my favorite quote from Don: "Their world is only as big as we make it."





SPECTRUM

- Banana flavored Primate (25% protein)
- Banana flavored Primate (15% protein)
- Omnivore (23% protein)
- Canine (28% protein)
- Ratite (proven for BOTH breeding & maintenance.)
- Polar Bear (eliminates need for fish.)
- Hoofstock Supplement (selenium added.)
- Hoofstock Diet Herbivore (just add hay.)

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

- Feline Diet (horsemeat — higher in protein than beef.)
- Bird of Prey Diet (horsemeat — higher in protein than beef.)
- Canine Diet
- USDA inspected horsemeat.

Zu/Preem®

- Primate Canned (650 IU Vit. D₃)
- Primate Dry (20% protein)
- Feline Canned
- Marmoset Canned (4522 IU Vit. D₃)
- Omnivore
- Ratite (proven for BOTH breeding & maintenance.)



DISTRIBUTORS OF PREPARED EXOTIC ANIMAL DIETS.

We can fill the majority of your feeding requirements economically with one FREE call.

Professional Sales Representatives

- Rob Mueller — Collect — 715-445-3605
- Rich Freitag — Collect — 616-963-3080
- Jerry Houghlan — Toll Free — 800-228-4005

Animal SPECTRUM Inc.

5801 Locust Street
Lincoln, Nebraska 68516
Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-3917



ELEPHANT ACCIDENT INVESTIGATIVE PROCESS

By
Ernest Galbraith, Animal Technician, Mammal Department
Kansas City Zoological Gardens, Kansas City, MO

In March and May, 1982, two employees were injured by the male African elephant. The first injury prompted an immediate investigation by the Elephant Management Committee (EMC). The second injury was also investigated by the same process as the first.

The EMC is a small group within the Zoo, molded much like the Elephant Committee here in Springfield. The role of the Committee is as important as proper health care for elephants; it ensures a well-rounded program of elephant management. Its members are deep-rooted and also stretch out to the highest levels. The top position and the one with the final authority is the Zoo Director. The next rung of the ladder is held by the Mammals Curator who chairs the Committee. The next by the Animal Technician of the Veldt area. The next by the Zoo Attendants directly involved in the elephant program who have been approved by the Committee. Together we have a check and balance system, a common voice that can be listened to with respect.

The responsibilities of the Elephant Management Committee are wide-ranged. The Committee is responsible for the task of interviewing all prospective elephant personnel. By doing an interview in this manner, several persons' first impressions can be analyzed instead of just one's and this allows us to get a broader view of the person. The Committee is responsible for making comprehensive reviews of the Elephant Management program. For example, personnel performance, safety procedures, and the personnel training are subject to this review. Also, the members of the Committee who actually work with the elephants examine each other's daily performance; and if a problem should come up, the problem is worked out in committee format. Another responsibility of the Committee is to review all incidents between the elephants and the personnel--and this list is not all-inclusive.

Now, for as long as elephants have been kept in captivity, incidents or injuries will occur. The purpose of this paper is to explain our review procedure in the event of an accident.

The purpose of the investigation was to examine the facts of the incident. We also wanted to know if there were any areas in our management program that needed modification. And we wanted to take a close look at the future of our African elephants.

The first step in our long journey to the facts was to collect statements from all Zoo personnel who were involved in one way or another and to collect statements from any responsible eyewitnesses. This collection was done immediately following the injury while it was still fresh in everyone's mind. The statements were then typed in draft form and a meeting date was set to review the statements. All of the reviewing was done in committee format with the complete Committee present. We even had people on the Committee come in on their days off so we could expedite the pro-

ELEPHANT ACCIDENT INVESTIGATIVE PROCESS, Continued

cess. Therefore, within a fourteen-day period, nine meetings were held. Once everyone was satisfied with the contents of their own statement, they were then retyped into the final statement.

The second step in the process was the formulation of conclusions. Members of the Committee who were not directly involved in the incident met to go over the statements. The point here was not to assess blame, but was to get to the facts; how and why the incident occurred and how it could be prevented in the future. This process was very involved; and conclusions had to be made in four general categories. For example: a) conclusions of the "pool test", b) the transfer of information of the incident to the back-up person, c) the injury/attack, and then d) conclusions were made on subjects that were listed as "general". So, by breaking it down into smaller categories, we feel we were able to thoroughly examine every aspect of the incident. Once the conclusions were roughed out, a draft form was typed up. Again, meetings were attended to go over the conclusions. This portion of the process was the most difficult to accomplish because people's feelings were involved. It takes a staff with open minds and professional attitudes to accept that mistakes in judgement were made.

The last step in the process was the formulation of recommendations. The recommendations were finalized into two parts: 1) problems to be solved by the Zoo and 2) problems to be solved by the City.

The Zoo started to solve our problems and to tighten loop-holes immediately. For example, structural modification of the elephant pen to allow more than one escape route; always, without fail, having two people within close proximity of each other while the elephants are being handled; and the elimination of any unnecessary hazardous activity. These are just a few.

As for the City's end of the problem-solving proposal, we suggested a non-contact area for the male elephant or moving the bull to another institution. Either one would be a major operation. Other recommendations were to be able to hire more qualified individuals and to alleviate excessive turnover by making the salary more attractive. So the City and the Friends of the Zoo got together and made the funds available for major structural changes in the Elephant House which would allow us to have a non-contact area for Casey, the male elephant. Also, the City allowed us to hire, for vacancies, qualified individuals not living in Kansas City and raised the salary commensurate with experience.

With elephants in zoos becoming more and more popular from year to year, elephant management programs will be started. I strongly urge any zoo that handles elephants to establish an Elephant Committee; and should any institution need to examine an elephant incident, the format of collecting statements, formulating conclusions, and formulating recommendations is one way that could work for you.



Keeper's Alert

Shipping an animal??? Be sure to use the Animal Data Transfer Form. This is a FREE service, courtesy to ALL Zoos and Aquaria from AAZK. When your supply of the forms is low, remember to contact me for a shipment of more. A simple postcard message will do. Contact: Bernie Feldman, Miller Park Zoo, 1020 S. Morris Ave., Bloomington, IL 61701.

A DISCUSSION OF AN ANKLE ABNORMALITY IN A
YOUNG AFRICAN ELEPHANT AT THE INDIANAPOLIS ZOO

By
Rise Dmytriw, Lead Elephant Keeper
and
Debbie Olson, Head Keeper
Indianapolis Zoo, Indianapolis, IN



The Indianapolis Zoo's six-year-old female African Elephant ("Kubwa") is experiencing a deformity in the rear ankle joints of both back legs, causing an inward buckling of the ankles when the weight of normal walking is exerted on them. The following is a brief discussion of the condition, its possible causes and the methods used to date in trying to correct the problem. It is important to note that the exact reason for the apparent deformity in the joints has not yet been discovered. At this point, however, it would appear most probable that the condition relates directly to dietary and behavioral factors. Dietary factors involve a slight imbalance in calcium and phosphorus blood values and a high protein diet causing growth problems. Behaviorally, a severe pacing pattern placed abnormal stress on the joints.

The condition was first noticed in July 1981. On the advice of Dr. Michael Schmidt, DVM (Washington Park Zoo, Portland, OR), blood tests and X-rays were obtained showing a discrepancy in calcium and phosphorus values. Since that time, successive blood work and X-rays, examined by veterinarians and radiologists, have proven inconclusive. Efforts continue to pinpoint the cause of the condition.

Kubwa's diet will play a vital role in her recovery. From the time she arrived, wild caught, in 1978 at age two, Kubwa was fed a combination of Sow Blox--pig feed containing 20% protein, and Schumaker--a horse feed containing 12% protein. This was supplemented with Vionate vitamins and mineral salt. Alfalfa hay was offered free choice. After several telephone consultations with Dr. Schmidt, Kubwa's diet was changed to one lower in protein --Omolene 100--a horse feed containing 10% protein--and timothy hay free choice. Vionate and mineral salt were continued and $\frac{1}{4}$ cup of Osteoform (a supplement containing calcium, phosphorus and vitamins A, D and C) was added to assure ample amounts of these important vitamins and minerals. Dr. Schmidt felt that being fed a diet so high in protein, Kubwa had probably grown too quickly, which was putting too much weight on her legs. He felt by slowing her growth with less protein and adding Osteoform to the diet, we might be able to correct the condition. He also suggested braces to support the ankles during this process if the joints looked bad enough. It is interesting to note that Kubwa's original diet is identical to the one Affie, a female African who resided at the Indianapolis Zoo for nine years, received. Affie was sent to Brookfield Zoo (Brookfield, IL) on loan in 1979, 10 months after Kubwa arrived, having outgrown the Zoo's facilities. Affie enjoyed apparently normal health and growth.

The condition has most likely been partially caused, or at least compounded, by the fact that Kubwa acquired the habit of pacing. To understand its causes and severity, some history of the Indianapolis Zoo is in order.

The Indianapolis Zoo was built in the early 1960's as a children's zoo and as such, the exhibits were designed with children in mind, enabling them to touch and feed as much as possible. In this setting, the Zoo

ANKLE ABNORMALITY IN A YOUNG AFRICAN ELEPHANT, Continued

would acquire a young elephant and keep it until it was too big to handle. The exhibit for these young elephants was circular with an area of approximately 70 square feet (diameter 30 feet), a 4-foot dry moat, and a combination packed dirt and poured concrete substrate that slopes slightly inward to an offcenter drain. Being circular, the enclosure offers viewing by the public on all sides. In this exhibit it is quite easy to touch and feed the elephant.

After a period of training, Kubwa was placed in this exhibit alone. Although Kubwa was trained much the same as most young zoo elephants, elephant keepers at the Indianapolis Zoo have other areas of responsibility besides elephant management. Keeper time with Kubwa could constitute only a small portion of the day. Apparently lonely and bored, Kubwa quickly acquired bad habits. Begging for food and allowing visitors to touch and tease were common. Kubwa also reacted to her situation by pacing in the circular exhibit. This pacing took the form of running in circles in a clockwise direction. While the route would never change, speed would vary anywhere from a slow walk to a run. In its severest form, Kubwa would literally run, head down, in circles seemingly unaware of her surroundings. Pacing was a problem in the inside quarters as well.

The elephant barn is 18' x 22' with a poured concrete floor which slopes to an off-center drain. Since Kubwa was chained at night, this presented no problem. But during the cold weather months when she was unable to go outside, Kubwa was left unchained in the barn all day. Kubwa literally ran in circles on a sloped substrate for 6-10 hours a day for three years. This abnormal behavior was never evident in any other situation, occurring only in the outside yard and inside barn. Requests by keepers to acquire another elephant for companionship, sell or loan Kubwa to another institution or place her in a more suitable enclosure were denied. Kubwa was too valuable an attraction in the small exhibit and there were no funds to build a new enclosure. Efforts to alleviate the pacing were attempted: --Kubwa was removed from the enclosure periodically during the day and led on the zoo grounds to relieve boredom. While she enjoyed the outings, they had no effect on the pacing.

--Obstacles were placed in the usual pacing route. Objects and the manner in which they were placed varied, but to no avail. Kubwa would simply adjust her route to the obstacle and continue pacing.

--As lack of companionship was likely a partial cause of the pacing, an eight-week-old African pygmy goat was introduced as a companion animal. We began by installing him in a dog crate outside the barn bars at night, where Kubwa could see, hear and smell but not touch him. In the outside enclosure he was introduced slowly in the presence of a keeper. While Kubwa was wildly aggressive at first, half-heartedly swinging her trunk or flaring her ears in his direction, in three weeks time, they could be left alone without incident. Today they spend 24-hours-a-day together. While the introduction was a success, it had no effect on the pacing. It is interesting to note, once again, that Affie was kept in the same exhibit under the same conditions, yet never developed any obvious abnormal behaviors.

By May 1982, Kubwa's ankles were still deteriorating and pacing was as severe as ever. The decision to finally remove her from the circular exhibit was made with the help of Ed Drake. Mr. Drake is a private elephant owner who was contracted to give elephant rides at the Zoo all summer. He signed another contract with the zoo, in part agreeing to keep Kubwa with his elephant (Butch, a 12-year-old Asian bull formerly from the Oklahoma City Zoo) during his two month stay. For those two

ANKLE ABNORMALITY IN A YOUNG AFRICAN ELEPHANT, Continued

months Kubwa was kept with Butch outside on normal substrate, chained on two legs whenever she was not being trained or given 'free time.' Free time was basically allowing Kubwa to roam an undeveloped area of the Zoo under keeper supervision. Training and free time off chains often constituted as much as 5-7 hours a day. At the end of the two-month period, Kubwa was a calmer, more manageable and better socialized animal, but her ankles remained unchanged.

It was clear at this point that the ankles needed support. On the suggestion of a consulting veterinarian, Dr. Justin Janssen, we contacted Fabri-tech, a local company which manufactures tack for horses. Fabri-tech claims the padding used for their products is exceptional in that it provides unusually fine protection from sores, and wears and washes well. Don Menchhofer, president of the company, was happy to work with the Zoo on a design for a device to support Kubwa's legs. By early September, he had built them.

Essentially, the brace consists of a nylon and leather fitted boot to which a U-shaped metal frame is attached. The frame provides a bar that runs vertically parallel to either side of the leg. Nylon straps bolted to the frame hold it on the leg. A nylon pad lies against the ankle. This pad, and thus the ankle, is pulled by means of crosswise nylon straps to the outside bar of the brace. As with any experimental device, there were, and still are, many problems. At first we were plagued with broken bolts, loose buckles and straps and broken soles. While we were quickly able to iron out these minor problems, other difficulties continue. While it would be best to support the ankles with braces 24-hours-a-day, we do not yet feel we have a brace we can trust all night. Kubwa currently wears the braces 8-9 hours a day while a keeper can monitor the situation. She is kept chained on two legs whenever she wears the braces. Our concern at this point is slippage at the heel. Mr. Menchhofer is now working on a modification to correct the problem. On the bright side, Kubwa is tolerating the braces very well. She appears unconcerned when the braces are on and has never tried to remove them or tamper with them in any way. We have had no problems with sores. Construction will begin soon to adapt a mixed species hooved stock exhibit to provide Kubwa with a larger enclosure where she will be exhibited with zebra and goats.

We are encouraged by our progress, but many questions remain, among them:

- Will Kubwa continue to tolerate the braces?
- Once left on 24-hours-a-day, will sores develop?
- Will Kubwa be able to lay down and get up at night with the braces on?
- Is it necessary to restrict movement by chaining when the braces are on or can Kubwa be allowed more exercise?
- How long will she wear the braces?
- Will she pace in the new exhibit?



Legislative News

Compiled by Kevin Conway

AAZPA SUCCESSFULLY OBTAINS EXEMPTION TO LABORATORY ANIMAL RESEARCH BILL

The Humane Care and Development of Substitutes for Animals in Research Act is a bill designed to protect the welfare of animals used in laboratory research benefiting and protecting human health and safety. As originally drafted, however, the bill would have also affected zoological institutions which receive federal awards for research on live animals. While those institutions receive minimal amounts of federal monies for research, the bill's definition of federal awards includes contracts, loans and cooperative agreements, in which zoos often participate. The term "research" is not defined.

The bill required that any zoo receiving federal awards for research on live animals be accredited by a private agency designated by the Secretary of Health and Human Services. Once accredited, the zoo would have to be inspected every three years. In addition, it would have to establish a three-member institutional animal studies committee (to include one community member concerned with animal welfare but not affiliated with the zoo, and one veterinarian). That committee would inspect the zoo twice per year.

When introduced, the bill was referred to two committees for action: first, Science and Technology and next, Energy and Commerce.

AAZPA representatives prepared a position paper which was sent with background materials to each member of the Committee on Science and Technology. We made numerous visits to the staffs of Committee members, differentiating the research conducted by zoological institutions and stressing the zoological community's compliance with other federal wildlife statutes such as the Animal Welfare Act. After considerable effort, we were able to get an amendment offered at the Committee markup session on 8-3-82.

The amendment exempts "research, experimentation, or testing intended to improve wild animal conservation, propagation or management." It should be noted that it does not exempt any research conducted on live animals for the purpose of benefiting human health and safety. The amendment was unanimously adopted by the Committee. The bill now goes to the Committee on Energy and Commerce for action.

---K. Vehrs
AAZPA Newsletter

HOUSE SUBCOMMITTEE HOLDS HEARING ON CAPTIVE PROPAGATION OF WILDLIFE

On 4 October, the Fisheries, Wildlife Conservation and the Environment Subcommittee held an oversight hearing on the relationship of the Endangered Species Act to ranching, farming and other forms of captive propagation of wildlife. The Act prevents the taking of endangered species and commercial trading of their parts and products in foreign commerce. The Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) is designed to regulate trade in endangered and threatened species. Under CITES, animal species listed on Appendix I that were bred in captivity for commercial purposes are treated as though they were listed on Appendix II where commercial trade is permitted with an export permit from the country of origin. Therefore, commercial activity could be allowed in the U.S. only for specimens bred in captivity. Under the CITES definition of bred in captivity, three criteria must be met:

LEGISLATIVE NEWS, Continued

- 1) initial removal of breeding stock from the wild must not be detrimental
- 2) subsequent additions of wild-caught animals must be limited to those needed to prevent inbreeding
- 3) there must be reliable production of second-generation offspring in captivity in order for the first generation and subsequent ones to qualify for the captive breeding exemption

There remains considerable controversy regarding captive breeding programs for endangered or threatened species for commercial purposes. The U.S. interprets the CITES definition to mean 2 full generations produced in captivity, but not all CITES members agree.

---AAZPA Newsletter

MONITOR GECKO LISTED AS ENDANGERED

The U.S. Fish and Wildlife Service has determined that the Monitor gecko Sphaerodactylus micropithecus, known only from Isla Monito in the Commonwealth of Puerto Rico, is an Endangered Species under provisions of the Endangered Species Act of 1973, as amended. This action is being taken because of the extremely small population size coupled with suspected predation by rats. In addition, the Service has determined that the entire island of Monito be declared Critical Habitat. All provisions of Sections 7 and 9 of the Act now apply to this species.

---Federal Register

EXPIRED PROPOSALS WITHDRAWN FROM LISTING CONSIDERATION

As amended November 10, 1978, the Endangered Species Act mandates withdrawal of proposed rules to list species which have not been finalized within two years of the proposal. The time limit has expired for the proposed rulemaking regarding the U.S. populations of the thick-billed parrot (Rhynchopsitta pachyrhynchus), short-tailed albatross (Diomedea albatrus), margay cat (Felis wiedii) and jaguar (Panthera onca) which were originally proposed for listing as Endangered on 25 July, 1980. The listing of the U.S. population of ocelot (Felis pardalis), which was proposed at the same time as the above species, was finalized on 21 July 1982. This notice constitutes the formal withdrawal of the listing proposal for the U.S. populations of the thick-billed parrot, short-tailed albatross, margay cat, and jaguar.

---Federal Register

PINE BARRENS TREEFROG REMOVED FROM ENDANGERED SPECIES LIST

The USFWS proposes to remove the Florida population of the Pine Barrens treefrog (Hyla andersonii) from the List of Endangered and Threatened Wildlife and Plants and to rescind the Critical Habitat that has been designated for this population. This action is being taken because recent evidence indicates that the species is much more widely distributed than originally known. Removal of this species from the List would eliminate all protection provided by the Endangered Species Act of 1973, as amended.

---Federal Register





BUILDING A SAFE, LONG-TERM ELEPHANT
BREEDING FACILITY AT THE CALGARY ZOO

By
John Lehnhardt, Elephant Trainer
Calgary Zoo, Calgary, Alberta, Canada

On 29 July, 1982, the Calgary Zoo opened a \$400,000 addition to its elephant facility. This new structure is designed to safely house an adult male Asian elephant and several females in an environment conducive to captive propagation. I would like to describe in detail the building's structure and planning.

In May, 1976, the Calgary Zoo received 1.2 Sri Lankan elephants (*Elephas maximus maximus*), all ages six month to one year, from the Pinnawela elephant orphanage run by the Sri Lankan Government Wildlife and Conservation Department. With this acquisition, the Calgary Zoo made a long-term commitment to breeding the Ceylonese elephant.

The original Calgary Zoo elephant enclosure, built in 1960 and vacant since 1975, was deemed adequate, with minor alterations, for the three infants. However, it was understood that the rather small facility (1500 square feet inside--4,000 square feet outside) would need major expansion to adequately house the male, say ten or more years down the road.

The male, Bandara, turned out to be precocious and aggressive. By age four he was mounting the females regularly and obtaining full erections. At five he was ejaculating frequently and at age six years he began his first episode of temporal gland drainage. At six and a half he copulated successfully. On 1 August, 1982, he began his third recorded temporal drainage. Today, he is seven years old and weighs approximately 4200 pounds. Bandara's behavior over the last two years has become increasingly aggressive and unpredictable, including several unprovoked attacks on trainers.

In the summer of 1981, the Calgary Zoo decided it was time to build an addition to its elephant facility that could house the male in isolation when necessary and allow the trainers safe working conditions. First, money was needed. No fund raising had been done for the elephants and available zoo capital was committed to several major construction projects already under way. Fortunately, the city of Calgary was able to loan the zoo most of the money, and the planning progressed.

Elephant trainers, zoo staff and architects sat down to design a workable building. Several major points had to be addressed. First, the Alberta winters are severe and long. The new indoor enclosure would have to be large and able to withstand adult elephant courtship and mating. The construction would take place over the winter, meaning that the elephants could not be moved from their existing enclosure.

Second, the male would need to be controlled by one person since the elephant trainers work alone over 75% of the time. Safety escape areas and remote control doors would be a necessity. Third, costs would need to be controlled as much as possible. The following is a description of the new addition.

A 60' by 60' addition was erected over what was the outside yard. The

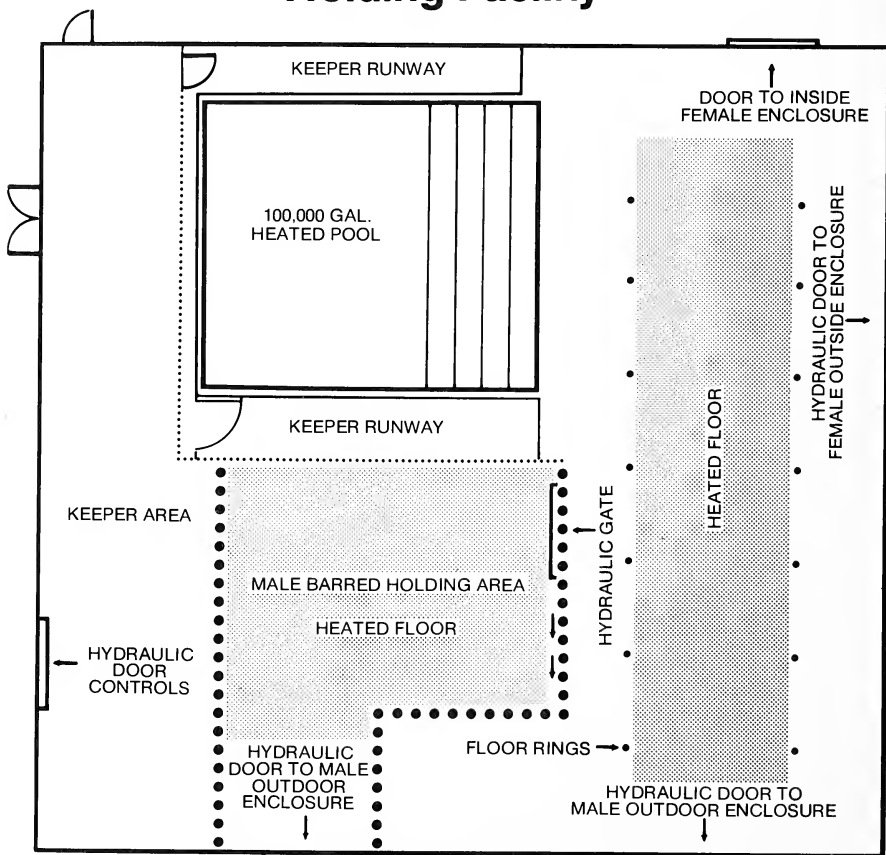
BUILDING A SAFE, LONG-TERM ELEPHANT BREEDING FACILITY AT THE CALGARY ZOO
(Continued)

two doors from the existing enclosure became the entrance to the new inside enclosure and the entrance to the new female outside yard. Thus no structural changes were made to the existing building. Two of the three new walls used the old moat walls for foundations, and the outside cement pool was enlarged and became the new indoor pool.

The walls consist of precast, insulated core, concrete panels each 6' wide reaching 24' up to the steel beam roof. Lighting, both fluorescent and mercury vapor, forced air heat ducts and ceiling circulating fans were installed beyond trunk reach about 20'.

The flooring is smooth concrete, sloped toward drains in three corners and the pool in the fourth. Electrical heat tapes with adjustable thermostatic controls are imbedded in the concrete floor throughout the enclosure to aid drying and to remove the chill.

Calgary Zoo MALE ELEPHANT Holding Facility



BUILDING A SAFE, LONG-TERM ELEPHANT BREEDING FACILITY AT THE CALGARY ZOO (Continued)

The major feature of the enclosure is the male barred pen or holding area. This consists of an "L" shaped area of approximately 600 sq. ft. surrounded by 16' long, 4" diameter concrete filled steel pipe sunk 4' into a concrete base. The pipes are spaced 16" apart to allow keeper access to the pen from 360 degrees, leaving no area where the male can corner a keeper or block his exit or pin him against a wall. There is a minimum retreat distance of ten feet from the bars to any wall, allowing adequate room to get out of trunk range. Remotely controlled hydraulic doors, one to the inside enclosure and pool, and one to the outside yard, control the male's movements. The barred design allows the keeper complete sight of the entire enclosure at all times and facilitates animal introductions without fear of injuries caused by the uncontrolled male. The male is chained in the barred pen overnight and routine foot and skin care is performed there.

The four hydraulic doors in the new enclosure are all operated from a 600 sq. ft. keeper area along the entire north wall. The doors, six feet wide and twelve feet high, can all be observed throughout their complete movement from the operator's station.

The expanded indoor pool is 4½ feet deep and holds about 100,000 gallons of water. Since winter tap water temperature in Calgary is barely above freezing, a heat exchanging system was connected to the boiler providing warm water in copious quantities for daily baths.

The functional elephant area of the new enclosure is 3000 sq. ft. This gives a total indoor area of 4500 sq ft. for the entire elephant facility.

Two new outside yards of 6500 sq. ft. and 5800 sq. ft. more than triple the area of the old yard. The old concrete bottom, eight foot deep dry moat has been replaced by a four foot deep soft bottom grass-lined moat. Stacked boulders add to the moat height on the public side and electric fencing on the elephant side discourage elephant exploration of the moat. A heavy four foot high metal bar around the male yard moat prevents an animal from being pushed into the moat. Such a fall into the old, deep, hard bottom moat resulted in the death of one elephant at the Calgary Zoo in the past.

Six large trees have been left in the yards to provide shade and a more aesthetic view. The tree limbs have been trimmed to above trunk reach and the trunk bark is protected up to twelve feet with electrified chicken wire. This also discourages the animals testing their strength at the trees' expense. The elephants tested all the electrical wires upon entering the yards and have since left them alone.

The yard substrate is coarse sand (six-inch cover) over natural gravel. About 200 sq. ft. of loam garnishes each yard for variety. It is felt that this surface, uneven and pliable, will be good for the feet and joints, compared to hard packed dirt or rigid concrete. The elephants also enjoy kicking and throwing the sand and dirt, especially after their morning bath.

In the two months that the new addition has been operational we have been extremely pleased with its functioning. The design success of the facility results from the cooperative efforts between zoo administration and elephant trainer staff. It is unusual for keeper staff to have as much influence on the final product as did the Calgary elephant trainers. This may be the key to the working success of the new facility.



A MANAGEMENT-MAINTENANCE PROGRAM
FOR OLDER ELEPHANTS IN MILWAUKEE

By
Roger Martins
Milwaukee County Zoological Gardens
Milwaukee, WI



Although all of our elephants were in generally good health, a decision was made in January of 1980 to train our elephants for a basic maintenance program so minor foot problems or other injuries could be cared for without anesthetizing them.

The first step was to buy the equipment needed, including a barrel of 3/8" proof coil chain and cleavices along with a barrel of 1" rope.

The animals we had to work with were three Asians--two are 30-plus years and one is 22 years old--and two Africans around 24 years old; all were females. We could go in with all of them for cleaning during the day and all were chained at night on front legs only. The Africans were previously taught to stretch. No other work was routinely done with them.

The next step was to get all the animals chained front and rear. Putting a chain on the front leg was routine, but ropes were used on the rear legs to position each elephant and hold them while a chain was put on.

Then we trained the elephants to lift each foot on command front or pad position for future daily maintenance work.

Next the chains were lengthened for backing up, lead out and hold. This way the elephants were taught to walk with us a few feet at a time and then carried on for walking with them when they were loose.

After unchaining, the elephants would go to a designated line-up area and then walk a little inside or outside and then were fed. When they were loose, we would always tell them to line up in the designated area inside or outside before doing anything else with them. This was a control measure which had them responding to a command before initial contact was made. (This procedure has been established and is in effect today.)

The next big step was teaching them to stretch. To do this, the front chains were shortened, one on each leg, so the elephant was close to the front of the stall. Then a chain and rope were put on each back leg. The rope was strung to make a modified block and tackle. The back legs were alternately raised on command and the slack taken up in the rope. This had the elephant's rear legs pulled back and she gently went down on her back knees and her front legs would automatically go forward in normal position. This way the elephant was not brought down with a hard crash to its knees. Extra manpower was needed to pull the ropes at first. The two older Asians learned this in a week's time, but the youngest one took a lot longer for reasons I will get to later.

The current daily routine summer version for Asians is to greet the animals in the outside yard where they stay overnight; line them up; walk them inside; chain front and rear alternate sides, feed morning pellet rations and then clean the yard.

Next comes the daily bath with the tops of their heads and backs being serviced in the stretch position.

A MANAGEMENT-MAINTENANCE PROGRAM FOR OLDER ELEPHANTS IN MILWAUKEE
(Continued)

After the bath, we do daily foot care and any other special needs. Each foot on each elephant is given special attention on schedule. A chart is kept and recorded; for example, right foot one day, next day the right rear; left rear on the third day; left front on the fourth day and on the fifth day right front again. The chained foot goes into a rubber tub to serve as a foot bath for any special needs, soaking medication for any medical problems. The unchained foot on that side of the elephant is placed on a stand to care for the cuticles and nail filing etc., then the foot pad to expose the bottom for any required care. Any foot that needs special care is done in addition to the normal rotation.

When this is finished, they are unchained, lined up, walked outside and fed the rest of the morning rations.

At 1:30 p.m. daily, a public demonstration explaining procedures used with the elephants is performed. Narrated by a member of Zoo Pride, a volunteer organization, these demonstrations are held four days a week. It consists of line-up, salute, walking around the yard in various directions with a trunk command and a present position mixed in different ways before the afternoon feeding and cleaning of the yard.

At the closing of the day, a line-up is again called for and they are again walked up to the feeding area and released.

The maintenance program I have just described is becoming very successful with the Asian elephants. It was very hard and was a time-consuming job at first. Many of us had some doubts as to whether this program could be accomplished. Things would start to go smoothly and then there would be a minor set-back of one step or another - back to square one. In the summer of 1981, there was one major set-back; they balked at being walked into the building at closing. We had to just open the door and let them come in on their own. Then they would be lined up and chained as usual. Everything else during the day went as it should. Through the winter of 1981-82, the people got more confidence in working the elephants inside and the elephants themselves more used to being worked. This spring, we got control of the walking-in part and things are working smoothly on all counts.

The biggest problems we had were with Annie, the youngest. She did most of the balking at walking into the building. With extensive dialogue with her for four mornings, she decided it was not "fun" to break formation. You might call her a "spoiled brat". One night last winter during her stretch training, she decided she didn't want to be chained and completely balked. It took us almost an hour to get a rope on a back leg, pull her tight to the front bars, get ropes on a front leg and the other back leg. Then it was downhill to maneuver her into position for chaining. The other two elephants just stood quietly with handlers at their sides and watched. This incident showed us what we could do as a team with the use of ropes as mechanical aids. We defeated the "game" that night and her stretch training progressed to where she readily does it on command now.

The biggest disappointment and set-back has been with the Africans. It started out the same as the Asians, but one of them, Babe, learned she could hit people when she didn't want to be worked anymore at a given time. This had started prior to the initial training and continued on. To complicate matters, the two elephants themselves didn't get along so they were kept on a front leg chain all day and double chained at night. Both learned to lift their legs on command for cleaning around them.

A MANAGEMENT-MAINTENANCE PROGRAM FOR OLDER ELEPHANTS IN MILWAUKEE *(Continued)*

The double chaining went on for about three months; then one night Babe balked at the rear chain and the people working at the time did not use all the aids available and lost her. She hasn't been rear-chained since and the African program did not go on for awhile.

The other African, Lucy, has cast herself three times due to a weakened condition from a pancreatic infection. We used block and tackle to help roll her into a stretch position, then she could raise herself. She is healthy again.

This spring we started a modified African program again with Lucy. In the morning she is double-chained for cleaning, bathing, and full tub and foot stand care. Hopefully, stretching again will start this winter.

Babe readily puts a front foot up to the bars to be chained from outside the stall on a chain that can be shortened or lengthened. She gets a daily bath; that is the extent of working her now. A retraining program is questionable at this time.

Both of them are outside during the day and separated at night--Babe outside and Lucy inside. At this point we go into the yard or stall only when Babe is on a chain.

Our whole elephant management program is governed by a committee of all the people who work the elephant area--six regulars and four rovers with management. This committee is patterned after the one at Dickerson Park Zoo, Springfield, MO. There is a meeting every other week. The most important rule is that there are at least two people with ankuses doing any work with or within reach of the elephants. Another important item is consistency of procedure by all parties. Any change in the program is talked over at a meeting before being implemented.

Our goal with this program is to first have manageable elephants that are healthy and clean from the bottom of their feet to the top of their backs.



Publications Available

The Proceedings of the 1982 Wildlife Rehabilitation Symposium, Volume I, are now available. The Volume contains 29 chapter and costs \$20.00 for hard-cover and \$15.00 for softcover. Make checks payable to: Treehouse Wildlife Center. Mail order to: "Proceedings", Dr. Paul Beaver, c/o Spencer Beaver, Beach Road, Beaver Lake, Ware, MA 01082.

The Proceedings of the AAZPA Annual Conference held in Phoenix will soon be available. Members price is \$12.00 per copy, and \$24.00 for nonmembers. They may be ordered from AAZPA, Oglebay Park, Wheeling, WV 26003.



CAPTIVE ELEPHANT MANAGEMENT
PROGRAM SURVEY

Compiled By

Larry Nunley, Large Mammal Supervisor
Tulsa Zoological Park, Tulsa, OK

Most zoos in the U.S. have elephants. In conjunction with this, most zoos have some form of elephant management program. There are several facts that are considered common knowledge about managing elephants in captivity, e.g. there are more zoo people killed or seriously injured by elephants than all the other types of zoo animals combined; most captive elephants inherit various types of foot and skin problems; and very few zoos successfully breed elephants in captivity.

The purpose of this survey is to gather information on the various elephant management programs in zoos throughout the U.S. This information will be categorized to determine the differences and similarities between these programs. Hopefully, an "ideal" elephant management program can be drawn up from this survey. I believe that such a program could be used as a guideline in helping zoos strengthen or improve their program if and when (or before) various problems arise.

RESULTS

I. Species, Sex, Age --of the zoos responding to the survey there were:

81 Asian females -- Average age 10.8 yrs.

5 Asian males -- Average age 10.4 yrs.

86 Asian elephants with 94% of them being females

59 African females -- Average age 14.5 yrs.

12 African males -- Average age 14 yrs.

71 African elephants with 83% of them being females

II. Housing

A. Is your barn heated? 88% yes

B. What do you consider the "ideal" barn temperature?
65°F with 45°F the low and 90°F the high

C. What kind of floor does your barn have?
95% have concrete floors

D. What kind of floor would you prefer?
69% prefer concrete
9% rubber
6% wood
2% soil

CAPTIVE ELEPHANT MANAGEMENT PROGRAM SURVEY RESULTS, Continued

- E. What percentage of time does your elephant(s) spend inside the barn?

63% is the average time spent in the barn. Of course this would vary depending on the location of the zoo and the time of year.

III. Chaining

- A. What size chain do you use? 50% use 3/8", 23% use 1/4", 16½% use 5/16", 3% use 7/16", 3% use 9/16" and 3% use 1/2"

- B. What kind(s) of chain connections do you use?

45% use brummels	26% snaps	7% carabiners
33% use clevises	16% shackles	7% padlock

- C. What is your chaining procedure? Majority of the zoos chain the opposite front and rear foot. Usually the elephants are put in a controlled situation and chain the front foot first then the opposite back foot. This procedure is reversed when unchaining the elephants.

- D. Do you experience any difficulty in chaining your elephants?
87% do not experience any difficulty in chaining their elephants.

- E. Are your elephants chained at all times while in the barn?
75% do not have their elephants chained at all times while in the barn.

- F. Are your elephants chained when they are outside?
76% do not chain their elephants when they're outside.

IV. Elephant Yard

- A. Does your yard have a pool? 84% have pools

- B. What kind of substrate does your yard have?
60% that responded have soil in all or part of the yard.
23% that responded have screening in all or part of the yard.
23% that responded have concrete in all or part of the yard.

- C. What do you think would be the ideal elephant yard substrate?
80% that responded said all or some of the yard should be soil.
15% that responded said all or some of the yard should be concrete.
17% that responded said all or some of the yard should be screening material.

V. Footcare

- A. Do you presently have a footcare program?
84% have a footcare program.
- B. Do you have a record system on what you do to their feet?
60% have some sort of footcare record system.

CAPTIVE ELEPHANT MANAGEMENT PROGRAM SURVEY RESULTS, Continued

C. What are your footcare tools and medications?

Medications

42% Kopertox

9% Hooflex

Others: Iodine, Nolvsan, Pine Tar,

Neatsfoot Oil, Betadine, Weladol

Tools

67% Hoof knife

74% Rasp

36% Snippers

19% Drawknife

D. What do you feel is the major foot problem of your elephants?

Most zoos state that their major foot problems are cracked nails and undermining of pads; overgrown or cracked cuticles is the third most common problem.

E. Can you relate various footcare problems to any external conditions either due to the yard and/or barn substrate?

Majority of the zoos said their foot problems were caused by external conditions due to the yard and/or barn substrate.

F. How often do you do footcare on your elephants?

15% daily

23% monthly

31% as needed

8% weekly

5% every two months

8% never

13% from 3 months to a year

VI. Skin

A. Do you experience skin problems in your elephants?

57% experience dry or dead skin

2% experience bed sores

2% experience abscesses of ingrown hair

36% experience no problems

B. Do you bathe your elephants? How often?

100% bathe their elephants

79% bathe their elephants at least once daily

C. Do you apply any type of oils or lotions to your elephants?

Neatsfoot oil is the most commonly used oil followed by mineral oil.

D. Do you relate skin problems to external conditions? Internal conditions?

Most zoos agree that skin problems are caused externally from dry air either caused by the climate or barn heaters.

VII. Commands

A. Do you have a list of commands? If so, would you please send us a copy?

40 zoos sent me a list of their commands

B. Do you have uniformity in your commands, i.e. everyone giving the commands in basically the same way?

81% do have uniformity in giving commands.

CAPTIVE ELEPHANT MANAGEMENT PROGRAM SURVEY RESULTS, Continued

VIII. Miscellaneous

- A. How many people at your Zoo are trained to work the elephants?

Average of 4.5 keepers

- B. As a safety precaution, do you always have at least two elephant people working the elephants at one time?

54% always have at least two elephant people working the elephants at one time.

- C. Have you ever weighed your elephants?

21% have weighed their elephants

- D. Do you have an elephant show or training program?

82% have some sort of training program.

- E. Do you have a female which you would consider placing on breeding loan?

74% do not have a female which they would consider placing on breeding loan.

26% would possibly consider this.

- F. Do you have the facilities to house a female on breeding loan?

78% do not have the facilities

12% do have the facilities

10% have the facilities to house a female on breeding loan, but they do not have a male.



Information Please

REQUEST FOR ASSISTANCE: A study examining the reproductive biology of the polar bears (*Ursus maritimus*) is currently in progress at the Washington Park Zoo, Portland, OR. The goals of the study include determination of the estrous cycle and detection and monitoring of pregnancy via analysis of hormonal metabolites found in urine samples. By a joint effort of research staff and keepers, we have devised a method of collecting urine from our female on a regular basis. Although our female has had several cubs, we cannot be sure that her estrous cycle is typical of all members of the species. In determining what hormonal fluctuations are typical, it would be very valuable to obtain, analyze, and compare samples collected from other cycling female polar bears. We would like to hear from zoos interested in cooperating in this project by providing urine samples from female polar bears. Assistance from zoos currently maintaining non-lactating polar bears would be most helpful. All cooperation will be fully acknowledged. Please contact Janet Baer at the following address: Washington Park Zoo Research Center, 4001 S.W. Canyon Road, Portland, OR 97221.

The Atlanta Zoo plans to update and improve its animal diets. We are asking zoos, institutions or individuals to send us a list of their animal diets for the following: Old World monkeys and apes, bears, cats, Asian elephants, black rhinoceros, birds of prey, psittacines. Any comments concerning these diets will also be appreciated. Please send information to: Alan Sharples, c/o Atlanta Zoo, 800 Cherokee Ave., S.E., Atlanta, GA 30315.

Chapter

The Topeka Zoo Chapter of AAZK is busy making final preparations for our winter party to be held 14 January. Staff and docents from neighboring zoos have been invited and we are looking forward to a good time.

Our November garage sale was a success as we cleared \$250 for chapter activities. In October, our chapter sponsored City Horticulturist Bob Foster's attendance at the Zoo Horticultural Conference in Wichita, KS. Bob enjoyed the trip very much and presented an informative talk about the conference at our December meeting.

Our first AAZK staff photo contest concluded last month. Everyone enjoyed showing off their photographic talent.

Tori Williams has replaced Charlotte Payne as Vice President for the Topeka Chapter.

The Puget Sound Chapter of AAZK would like to thank Bela Demeter and Ralph Konrath for sending back issues of AAZK Newsletter as requested in a previous AKF. There is a complete set of AAZK publications (AAZK Newsletter, The Keeper, Animal Keepers' Forum) on file at the Woodland Park Zoological Gardens Library, beginning with Vol. 1, No. 1 dated May 1, 1968.

News

President Angelo T. Arena of the Bronx Zoo AAZK Chapter, reports that the Chapter has donated \$108 to the World Wildlife Fund- U.S. for three acres of rain forest land at La Planada in Columbia, South America. (See Nov. 1982 AKF, p.266).

Newly elected officers of the Oklahoma City Zoo AAZK Chapter are:

President.....John Walczak
Vice. Pres.....Diane Hoch
Sec/Treas.....Penny Foldenauer

Decals: The official AAZK decal is available through the Memphis Zoo Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.50 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Ave., Memphis, TN 38107.

Please send _____ button(s) for 50¢ each.

Name: _____

Address: _____

City _____ State _____ Zip _____

AAZK ACCESSORIES AVAILABLE

Pins And Charms: Enameled three-quarter inch pins and charms with the official AAZK logo are now available. They are done in the same colors as the AAZK Patch and the charms are suitable for necklaces (you provide the chain). The price per pin or charm is \$3.50 which includes postage. To order send your name, complete mailing address, number of pins or charms desired to: AAZK National, 635 Gage Blvd., Topeka, Ks 66606. Make check or money order payable to AAZK National.

Buttons: For a "Keepers Care" Button, send the coupon and 50¢ to: Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614.

SPRINGFIELD HOSTS NATIONAL ELEPHANT SEMINAR

By
Phyllis Dark
Convention & Visitors Bureau
Springfield, MO



The site of the Third Annual Elephant Seminar on 9 and 10 October 1982, a national event for zoo professionals, was Springfield, MO. The first meeting took place in Tulsa, OK and in 1981 the meeting moved to San Diego. The fact that it landed in Springfield this year is a result of the effort put in by the staff of the Dickerson Park Zoo to secure it, the excellent elephant program already underway in Springfield, and the fine convention facilities offered there.

Hosts for the meeting were the Springfield Park Board, staff members of the Dickerson Park Zoo, Friends of the Zoo and the Zoo Docents, and the local chapter of the American Association of Zoo Keepers (AAZK).

Hilton Inn of the Osarks was headquarters. The main meeting was preceded by a get-acquainted party, during which the registering elephant experts got a chance to talk shop with a number of others with the same weighty problems on their minds.

The Conference program began on 9 October with a welcome to Springfield by Dale Tuttle, director of the Dickerson Park Zoo, and a talk by Jeanne Roush, representing the Humane Society of the United States. Other papers presented were on the management of bull elephants at Portland, Oregon's Washington Park Zoo, building a safe, long-term breeding facility at the Calgary, Alberta, Zoo, a report on progress at Chicago's Lincoln Park Zoo, and a management-maintenance program for older elephants at the Milwaukee County Zoo. Conference participants learned how to deal with a broken jaw on an African elephant and osteomyelitis and pododermatitis in a 15-year-old female Asian elephant. Among the 18 papers given were those on foot and skin care at the Sedgwick County (KS) Zoo and the Dickerson Park Zoo.

Host zoological curator Paul Price was elated that the conference had chosen Springfield for its third annual meeting place. He said that in the short time since it started, the conference has come to be regarded as a must for professionals who deal with elephants on a day-to-day basis.

Main purpose of the yearly meetings is to give professionals with an interest in elephants a chance to meet their colleagues. These include zoo directors and curators, elephant handlers, trainers, and veterinarians. Of great importance, also, are support groups such as Friends of the Zoo, including volunteer docents, who are interested in upgrading all phases of animal management at their city's zoo.

The meeting covered discussions of many topics, including management techniques, training techniques, and particular questions dealing with Asian and African elephants. Special emphasis was put on the history and the future of elephants, as well as methods of setting up breeding programs to assure a future supply of elephants for zoos.

The Asian elephant is now considered an endangered species, with only about 30,000 still existing in the entire world. Zoos in the United States have about 200 Asian elephants, and the Portland, Oregon, Zoo is

SPRINGFIELD HOSTS NATIONAL ELEPHANT SEMINAR, Continued

the only one in the Western Hemisphere that is successfully breeding Asian elephants. The youngest of Springfield's elephants is a second-generation example of the Portland program.

According to Dale Tuttle, attendance at the conference included representatives of 61 institutions from 24 states, Canada and Washington, D.C. The total of 159 participants was more than double the number of those who attended earlier conferences.

"We've worked very hard to get them here," said Tuttle. "Last year we demonstrated our elephant program at a regional conference in Kansas City, and I think word spread that Springfield is active in the elephant business. There are a number of zoos larger than ours that have fewer elephants than we do. Springfield has four Asian elephants, two males and two females. Ours is one of only a few zoos in the country keeping two Asian bull elephants. There are only about 17 male Asians in the country."

The Springfield Zoo's oldest elephant, "C.C.", is an Asian, and she led to the acquisition of three more of the same type. Springfield is now operating a cooperative breeding program with the St. Louis Zoo, involving a total of eight females. In the program, careful blood studies must be made to plot estrous cycles, to indicate when the females are ready for fertilization. The gestation period is 23 months.

Tuttle feels that the good nutrition enjoyed by zoo-kept elephants has brought them to sexual maturity at an early age. Males are well developed at seven or eight years; females can start reproducing at about age 10 and can continue for 30 years. Young elephants remain close to their mothers for several years; they are helpless when born and must be taught how to eat and how to use their trunks to gather hay and grain.

Elephants are intelligent and responsive to training. It is not unusual for them to learn 50 voice commands. They are complete individuals and occasionally feel the need to assert themselves, with the result that people handling them must be careful not to get hurt.

The main health problem is with their feet. Standing and walking on concrete most of the time is unnatural for elephants, and a lot of foot care is necessary to prevent infections, particularly under the toenails. Arthritis also is a frequent problem. Skin care is a major concern, because the elephants don't have the opportunity to rub against trees and find the different kinds of dirt and straw they like to toss on their backs for skin protection. Keepers must work with elephants' skin daily, keeping them scrubbed and rubbed down.

An elephant's diet consists of up to four bales of hay a day and various supplements, including as much as five gallons of grain.

Although most of the Springfield seminar's visitors were from zoos, one colorful character, Sabu, billed himself as an elephant historian. Sabu worked with the elephants at Ringling Brothers Circus for most of his 72 years. Curley Harper from the National Zoo came to the conference to exchange information with other participants. He likes to compare notes, he said, and find out how others go about handling their elephants.

Smokey Jones of Fontana, Ca, has enjoyed a career as an elephant trainer. He came to the conference from the Louisville Zoo where he had just finished a training job. He said that training works best when elephants

SPRINGFIELD HOSTS NATIONAL ELEPHANT SEMINAR, Continued

are started early, at about five years of age. Trainers have to know what they're doing, he said, or they will waste a lot of time experimenting.

Benny Henry has been retired for nine years from the Kansas City Zoo. He said that once you're an elephant person you stay one all of your life. He is proud of the fact that while he was at Kansas City, he became the first in the country to train a pair of African elephants.

Mark Rosenthal, curator of mammals at Lincoln Park Zoo, came to the conference with a large group. Lincoln Park has just finished building a large mammal complex and has brought back a lot of animals that were once at the park, Rosenthal said, including two elephants. Their group has never worked with elephants, and they are interested in putting together a really good elephant management program. Four of the zoo's elephant handlers are women, he added.

Wayne Jackson is a keeper at the Metropolitan Zoo in Toronto, Canada. The Toronto Zoo has eight African elephants, including one born two years ago, and is expecting several more. The cold climate makes the cost of elephant keeping almost prohibitive in Canada, Jackson said, and there are probably no more than 20 in the whole country.

Ed Schroeder came to the conference with a group from Milwaukee County Zoo. Their object was to observe Springfield methods and pick up new information. Schroeder mentioned the importance of handling elephants in a consistent manner from day to day.

Bob Cerracuso, a keeper at the Bronx Zoo, said that their elephants sometimes decide not to take their medication. Keepers can generally fool them, however, by hiding medicine in bananas or in loaves of Italian bread.

Trudy Schuetze has worked at the San Antonio Zoo for five years. She said that many young people are going into zoo work now, and they find it a good field. She added that it helps to start out young, while a person is still willing to learn a lot.

Rise Dmytriw is an elephant keeper at the Indianapolis Zoo. She really enjoys these meetings, she says. Coming from a small zoo, she learns a lot from visiting with those from more sophisticated operations. She likes to get together with other keepers to discuss care of elephants' feet or skin, how to train, methods of breeding, what kind of work others are doing and what strides they're making.

Sandy Kemske is curator of mammals at the Baltimore Zoo. Her employer presently has only two African cows, but at Baltimore they are building a new exhibit and will soon be able to house seven elephants in a much bigger area. "These meetings really save you a lot of trouble by teaching you to do things the most efficient way," Kemske stated.

Steve Kingswood is from Wichita's Sedgwick County Zoo. Wichita personnel have a basic maintenance routine similar to Springfield's, he said, and they have trained five people to work with their two African females. They stress consistency in dealing with the elephants, varying the sequence occasionally and introducing new commands on a regular basis.

Mark Kabak is an elephant keeper at the Kansas City Zoo. He was pleased to attend a meeting in nearby Springfield and he reported a lot of change

SPRINGFIELD HOSTS NATIONAL ELEPHANT SEMINAR, Continued

at his zoo, with new elephants, new facilities, and a new keeper management program.

Marilyn Fackler is an animal keeper at the Los Angeles Zoo. She sees an increasing number of women working at zoos. "The field has just opened to them in the past few years," she said. Why, she was asked, are women particularly good at zoo work? "They're sensitive to the needs of the animals."

Joanie Stinson has worked at the Phoenix Zoo for seven years. There have been women in all the large mammal areas of her zoo for the past five years, she said.

Lucille Sweeney supervises the elephants at Houston Zoological Gardens. Houston is working with Lincoln Park Zoo on a breeding program, she announced, and the cooperative program is expecting its first birth soon.



BOOK REVIEW, Wild Elephants in Captivity, Continued

use. There is no mention of how to train an elephant for logging or as a beast of burden. I would love to know how the Singhalese teach their elephants to carry a chain and gag from which can be suspended heavy weights, or how to teach an animal to accept a saddle or a char-jama.

None of these are covered, and although I agree with Dr. Adams that a performing elephant interests zoo visitors more than a dejected animal swaying or rocking, I am sure that a working animal would be appreciated by even more people, including those who would be dismayed by a performing one.

The chapter on Musth and the Temporal Gland is good; exploring the perennial questions with much more depth than elsewhere. The results of the author's own research tell us not all but more than is usually considered, including the differences in usage of the temporal gland of Loxodonta and Elephas.

The section on diets was quite good, but erred on the side of being too elementary and generalized. I would have liked to have seen some diets in use given as examples. The diet for bottle-feeding was useful information.

To conclude, I must say NO not the definitive book on elephants and keeping them, etc. but the most useful that I have read so far. I hope that an updated version will be published soon, even though this book only came out in November 1981. An index and bibliography and references should be included in a book of this nature and perhaps a little more research.



(Editor's Note: This book review originally appeared in RATEL, the journal of ABWAK, The Association of British Wild Animal Keepers, Vol. 9, No. 3. It is reprinted here with permission from the editor.)

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ZOOKEEPER...requires six months' experience in care and maintenance of wild animals; some college preferred. Responsible for care of small mammals, hoofed stock, reptiles and amphibians. Salary \$5.01 per hour, plus benefits. Send resume to: Gordon Henley, Jr., Director, Ellen Trout Zoo, P.O. Drawer 190, Lufkin, TX 75902.

WOODLAND PARK ZOO JOB OPENINGS...applications available beginning 13 January for: Zoo Keeper (\$9.27/hr.), Senior Zoo Keeper (\$10.22/hr.), Zoo Curator (\$11.17/hr.). One-year experience in care/maintenance of zoo specimens is required for entrance exam. Applications and information available from City of Seattle, Personnel Dept., Room 446, Dexter Horton Building, 710 Second Ave., Seattle, WA 98104. Closes 27 Jan.

ANIMAL CURATOR...requires professional and technical work, background in captive and wild Pacific Northwest animal management, experience in record keeping, dietary requirements, general health-care, administration, budget and exhibit design. Degree in zoology or related field desired. Salary \$22,590. Submit application and resume to Personnel Dept., Metropolitan Park District of Tacoma, 10 Idaho St., Tacoma, WA 98409.

ZOOLOGIST...responsible for care of the collection, record keeping and supervision of animal staff. Requires degree in zoology or related field and two years' experience in animal husbandry, one year supervisory. Salary \$12,000-\$13,000. Send resume to Paul Meyers, Exec. Director, Ross Park Zoo, 185 Park Avenue, Binghamton, NY 13903.

o
p
p
k
o
r
t
n
i
t
y
c
k
s

ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession.

The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. If any AAZK members are interested in the PCS and would like to participate in the committee, please contact Committee chairman Kevin Conway at the address below. Presently any correspondence to the PSC should be broken down as follows: AAZK members responding east of the Mississippi contact Kevin Conway; west of the Mississippi contact Jan McCoy.

Kevin Conway
NZP/Conservation&Research Center
Front Royal, VA 22630

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



FEBRUARY 1983

Animal Keepers' Forum

Smithsonian Institution Libraries



Dedicated to Professional Animal Care

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Connie Cloak
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 President
Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
Steve Taylor, Louisville Zoo, Louisville, KY 40213

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Audubon Park Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Foyal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
<u>Bernie Feldman, Miller Park</u>	<u>Mike Coker, Topeka Zoo</u>
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Ed Roberts	Walter D. Stone Zoo	ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeiffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D. C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Croft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Laurence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's Keeper/Artist is Chris Rasums of the Little Rock Zoo in Arkansas. Chris's artwork features a unique interpretation of a Patagonian cavy named "Durante". Thanks, Chris!

Scoops and Scuttlebutt

ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession.

The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. If any AAZK members are interested in the PCS and would like to participate in the committee, please contact Committee chairman Kevin Conway at the address below. Presently any correspondence to the PSC should be broken down as follows; AAZK members responding east of the Mississippi contact Kevin Conway; west of the Mississippi contact Jan McCoy.

Kevin Conway
NZP/Conservation&Research Center
Front Royal, VA 22630

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

DELAYED ADDRESS CHANGES COSTLY TO ASSOCIATION

All members are reminded that it is very important that you notify the National Headquarters of AAZK when you have a change of address. It is vital that you do this as soon as possible to avoid having your AKFs returned "address unknown". National must pay 25¢ postage due for each returned issue. If you have not notified National on an address change and we receive your AKFs postage due, we cannot mail you out another copy free of charge. There will be the standard \$1.00 per issue charge for all additional copies sent out to members failing to notify us of a change of address. We realize that there are times when address changes come up suddenly. If this is the case, please call us to notify us of the change. We can be reached at (913) 272-5821.

MEMBERS URGED TO ASSIST IN SURVEY REQUESTS

At the back of this issue of the Forum, there are two survey requests. One is for the Staff and Technology Exchange Program and the other is on Polar Bears. We urge members to complete both surveys and return them to the requesting parties. Gathering of data to assist in the establishment of a new program or for research purposes is difficult at best, but is made even more so when insufficient surveys are returned. So, please take a few minutes and fill in these surveys and return them to the addresses included on the survey.



Births & Hatchings

BROOKFIELD ZOO.....*John S. Stoddard*

December 1982 B & H from Brookfield Zoo include: Reptiles - 0.0.1 Red-eared slider, 0.0.1 Siebenrock's pond turtle; Birds - 0.0.3 Red and white crane, 0.0.2 Blue-grey tanager, 0.0.1 Blue shouldered robin chat, 0.0.3 Saffron toucanette; Mammals - 0.0.1 Squirrel monkey, 0.0.19 White-toothed shrew, 0.0.1 White-fronted mouse, 0.0.1 Kolb's monkey and 0.1 Reticulated giraffe.

RIVERBANKS ZOOLOGICAL PARK.....*Tony Vecchio & Lex Glover*

1982 was a very successful year for us here at Riverbanks. In the second half of this year (July-December), the mammal department saw the births of: 1.0 Siamang, 0.2 Polar bears (DNS), 0.0.1 White-faced Saki monkey, 0.0.1 DeBrazza's monkey, 1.0.1 Cotton-topped tamarin, 0.0.1 Lion-tailed macaque, 0.1 Eland, 1.1 Greater kudu, 1.0 Baird's tapir and 0.0.1 Matschei's Tree kangaroo.

The Bird Dept. recorded successful hatchings of: 11 Ringed teal, 10 Red crested touraco, 2 Chilean flamingo, 2 Black-foot penguin, 2 Mountain witch dove, 5.2 Brazilian teal, 3.4 White-faced tree duck, 13.6 Radjah shelduck, 3 Bali mynah, 3 Blue-crowned mot mot, 3 Luzon bleeding heart dove, 3 Pied hornbill, 4 Sun conure, 4.1 Black-necked swan, 2 Germain's peacock pheasant, 3 Roul roul, 4 Bluebills, 4 Crimson seedcracker, 0.1 Eclectus parrot and 3 Burrowing owls.

In addition to 1982's many births and hatchings, we at Riverbanks were also the proud recipient of the Edward H. Bean award. This award was presented to Riverbanks at the AAZPA annual conference in Phoenix. We received the award for the long-term reproduction of the Black Howler Monkey.

DALLAS ZOO.....*Tami Jones*

December 1982 births and hatchings at the Dallas Zoo include: 3 Pueblan kingsnakes, 2 White-cheeked touraco (DNS), 4 Yellow-fronted canaries (DNS), 1 Jandaya conure, 1 Gouldian finch, 4 Blue-headed parrots, 3 Black swans, 1.0 Kirk's Dik Dik, 1.0 Kirk's Dik Dik (DNS), 1.0 Axis deer, 1 Patagonian cavy (DNS), and 1.0 Pygmy hippopotamus (DNS).

BRONX ZOO.....*Margaret Price*

Births and hatchings recorded at the Bronx Zoo for the month of December 1982 include: Birds: 0.0.1 Green junglefowl; Reptiles: 11 Red spitting cobra; Mammals: 0.0.4 Acouchi, 0.0.2 Pen-tailed bettong, 0.0.4 Wild cavy, 0.1 Brow antlered deer, 1.0 Black backed duiker, 1.0 Polar bear and 1.0 Lesser galago.

TOPEKA ZOO.....*Mike Coker*

Recent additions to the Topeka Zoological Park's collection include: 1.0 Reticulated giraffe, 0.1 Common eland, 1.0 Grant's zebra, 4.0 Six-banded armadillo (2 DNS), and 0.0.1 Blue crowned pigeon.

BIRTHS AND HATCHINGS, Continued

The Zoo's adult gorillas, Max and Tiffany, have been sent out on breeding loans during the completion of the gorilla exhibit in the Discovering Apes Complex. Max has gone to the Denver Zoo and Tiffany was sent to the Buffalo Zoo.

WASHINGTON PARK ZOO, PORTLAND, OR: ELEPHANT CALF #22 JOINS #21...

The Washington Park Zoo reports the following notable births: 1.0 Asian elephant born 1 Oct. '82 and 0.1 Asian elephant born 26 Dec. '82. This brings the total number of elephant births for the WPZ/Portland to 22. The male calf is Hanako's fourth and Tunga's first offspring. The female calf is Pet's fifth and Pachy's sixth offspring.



Coming Events

AAZPA WESTERN REGIONAL CONFERENCE

March 6-8, 1983

Santa Barbara, CA

The Santa Barbara Zoo will be hosting the Western Regional Conference this year. We would like to extend a special welcome to all keepers. For information and registration materials, please contact Susan Engfer, Santa Barbara Zoo, 500 Ninos Drive, Santa Barbara, CA 93103, (805) 962-5339. Hope to see you in March!

AAZPA SOUTHERN REGIONAL CONFERENCE

March 20-22, 1983

Memphis, TN

Call For Papers: We cordially invite you to submit a paper for presentation. Papers covering all aspects of zoo biology are solicited. Please submit outline or abstract as soon as possible to: Charles Wilson, Memphis Zoo and Aquarium, 2000 Galloway Ave., Memphis, TN 38112.

AAZPA CENTRAL REGIONAL CONFERENCE

March 27-29, 1983

Albuquerque, NM

GREAT LAKES AAZPA REGIONAL CONFERENCE

April 10-12, 1983

Evansville, IN

Call for Papers: All AAZPA members interested in presenting a paper at the Conference to be held at Mesker Park Zoo should contact Mark S. Rich, Director, Mesker Park Zoo, Bement Ave., Evansville, IN 47712.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 24-26, 1983

Pittsburgh, PA

You are cordially invited to attend the 1983 AAZPA Northeastern Regional in Pittsburgh. The Pittsburgh-Greentree Holiday Inn has been selected as the conference site. Registration forms and further information may be obtained by contacting: Regina Grebb, Pittsburgh Zoo, P.O. Box 5250, Pittsburgh, PA 15206. A full program is being planned but can only be accomplished through your participation. The conference will include workshop presentations, trips to the Pittsburgh Zoo and Aviary and will conclude with a banquet. ALL KEEPERS ARE INVITED TO ATTEND!



A CASE STUDY OF URINARY TRACT PROBLEMS IN A MALE CHEETAH

By

David K. Luce, Mammal Keeper
Dallas Zoo, Dallas, TX

An eight-year-old male cheetah (*Acinonyx jubatus*) exhibited hematuria for several days. He was anesthetized using Ketamine Hydrochloride and Xylazine Hydrochloride, for a physical examination which revealed no physical abnormalities. Urine was collected for urinalysis and bacterial culturing. Blood was also taken for CBC and serum chemistries. The preliminary diagnosis was probably cystitis and a therapeutic regimen of oral ampicillin and methuonen was started.

The laboratory results of the urine culture demonstrated bacterial growth which was ruled out as contaminates, probably picked up during the collection procedure. Therapy for cystitis was continued.

Two weeks later there was no appreciable change in the cheetah's status as hematuria was still present. The animal was again anesthetized for urine collection, blood samples and radiographs. The radiographs revealed a small radiopaque object in the area of the GI tract or kidneys. The diagnosis was revised to now include a possible kidney stone, ureterolith, and cystitis. The bacterial cultures on the urine were negative for bacterial growth.

A radiologist was brought in to do an IV Plyogram. The procedure involved the injection of a marker dye into the blood stream via the cephalic vein and at intervals of 0, 1, 5 and 30 minutes radiographs were taken, which revealed an obstruction in the renal pelvis of the left kidney, and evidence of pyelonephritis in the right kidney.

Based on these findings, surgery was scheduled. The cheetah was transferred from the Dallas Zoo to the Veterinary Hosptial at Texas A & M. Upon arrival, the cheetah was transferred to a holding unit where he was tranquilized with Ketamine Hydrochloride and Xylazine Hydrochloride via a blow dart injection. Once under the affects of the drugs, he was intubated and maintained on an inhalation anesthetic and oxygen.

Radiographs were again taken to evaluate his present condition as it had been two weeks since the IV Plyogram. At this time, a second smaller stone was discovered in the renal pelvis of the right kidney. It was decided at that time that surgical removal of the new stone would not be attempted. But instead we would wait to see if the new stone would be passed.

After the cheetah was prepped, he was taken to the operating room where IV fluids were started and an ECG monitor was attached. The skin incision was along the mid-ventral aspect of the abdomen, approximately 25 to 30cm long. The kidneys were exposed and the left kidney was isolated. An incision was made in the renal pelvis and the ureterolith was removed. The ureterolith was ovoid in shape and roughly measured 1cm long by 0.5cm wide. The renal pelvis was sutured closed and all organs were replaced.

Before the abdomen was closed a small piece of liver was removed for an investigation into liver diseases which are common in captive cheetahs.

URINARY TRACT PROBLEMS IN A MALE CHEETAH, Continued

During the closure of the abdomen, the cheetah was slowly being taken off the anesthetic. After closing was completed, he was taken off anesthetic completely and the ECG monitor was removed and the IV fluids discontinued. The cheetah was placed in his transfer crate and allowed to recover. Within 30 minutes he had recovered sufficiently for transport.

Post-operatively he was monitored for further urinary problems. Also, to aid in the passage of the ureterolith in the right kidney, salt was added to his diet to increase water consumption and urine output. At this time no further complications have arisen.

To our knowledge this is the first recorded case of bi-lateral ureteroliths in cheetahs. Although we are not sure as to what initiated the formation of the ureterolith, a bacterial infection is thought to be the causative agent. If you have any information on ureteroliths in cheetahs, we would appreciate hearing from you.



Milwaukee Chapter Presents Reptile Demonstrations



By *Cliff Van Beek, Reptile Keeper*
Milwaukee County Zoo, Milwaukee, WI

The Milwaukee County Zoo kicked off a new program of live reptile demonstrations in 1982. The talks were held at a site outside our Reptile-Aquarium building from 29 May through 11 September. Bleachers were set up to accommodate up to 250 people and a stage and P.A. system were used by the speakers. The talks ran about 20 minutes in length and had a five minute question and answer period after the talk. Two talks were given on weekdays and three daily on weekends, weather permitting. In all, over 220 programs were presented to over 26,350 people, a little over 3.5% of the people who attended the zoo during the 100 days the talks were presented. Milwaukee Zoo has an annual attendance of over 1.1 million.

The main thrust of the talks was conservation, ecology and general familiarization with reptiles and their handling. Species used included pythons, alligators, bull snakes, tortoises, beaded lizards and even tarantulas. The talks were well received by the public with many people commenting positively on the interaction with the staff and the knowledge gained about the animals. The four keepers who gave the talks were also enthusiastic about the talks. We intend to continue these talks in 1983 and hope to improve them. This is a part of the Milwaukee County Zoo's expanding program to bring visitors, keepers and the animals they care for closer together.

If any of the Forum readership has any comments, suggestions or would like more information on our reptile talks, please write our local AAZK Chapter.



UNIVERSITY OF THE PACIFIC OFFERS
AFRICAN SAFARI FOR COLLEGE CREDIT



A 21-day educational tour of Kenya aimed primarily at zookeepers and others who work with exotic animals is being offered by College of the Pacific, Dept. of Biological Sciences, Stockton, CA. The safari will be an official offering of the University of the Pacific's Office of Lifelong Learning. Participants can apply for 2 units of Extended Education credit (\$98 fee); those who do will be required to write a library research paper on some aspect of East African Wildlife and to share their knowledge of the subject with the group around the campfire some evening.

The tour will depart the U.S. on 12 September and return 2 October 1983. The group will meet for departure at JFK Airport, New York. Cost of the tour, including roundtrip airfare to Nairobi from New York is expected to be \$2,875 (based on the projected roundtrip Apex fare of \$1,273).

In addition to 14 days game viewing in parks and reserves of Kenya, the safari will include at the onset a tour of London Zoo, with opportunities to meet zoo personnel, and two days at the Jersey Wildlife Preservation Trust, Channel Islands. The itinerary in Kenya will include Nairobi; Nairobi Park; Amboseli/Mt. Kilimanjaro; Tsavo West/Mzima Springs; four Rift Valley Lakes (Nakuru, Naivasha, Bogoria, Baringo) to view birdlife, Braingo giraffe and steaming geysers; Samburu to observe Somali fauna such as Grev's zebra, Somali ostrich, reticulated giraffe; and Masai Mara, where one can witness the great migrations of wildebeest and zebra into the Northern Serengeti. An optional 5-day extension to the Indian Ocean will be offered at extra cost.

In Nairobi, the participants will stay in a downtown hotel, but otherwise in Kenya you will be camping out. Participants will help with some routine camp duties such as setting up their own tents and a camp staff will prepare meals. All camping equipment except sleeping bags is provided.

Tour price includes all meals while camping, hotel & breakfast in Nairobi and on Jersey, luncheon at London Zoo, and ferry to and from Jersey.

The tour will be led by Dr. Richard Tenaza, Associate Professor in the Biological Sciences Dept. His professional background is mainly in animal behavior. He has conducted or participated in studies of primates in Thailand & Indonesia, penguins in Antarctica, lemmings in the arctic and birds in California. In addition, Dr. Tenaza has led ten previous educational tours to East Africa. He will be responsible for leading the tour and for any academic credit.

For further information and application forms, interested persons should contact: Dr. Richard Tenaza, Dept. of Biological Sciences, University of the Pacific, Stockton, CA 95211, (209) 946-2182.





SPECTRUM

- Banana flavored Primate (25% protein)
- Banana flavored Primate (15% protein)
- Omnivore (23% protein)
- Canine (28% protein)
- Ratite (proven for BOTH breeding & maintenance.)
- Polar Bear (eliminates need for fish.)
- Hoofstock Supplement (selenium added.)
- Hoofstock Diet Herbivore (just add hay.)

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

- Feline Diet (horsemeat — higher in protein than beef.)
- Bird of Prey Diet (horsemeat — higher in protein than beef.)
- Canine Diet
- USDA inspected horsemeat.

Zu/Preem[®]

- Primate Canned (650 IU Vit. D₃)
- Primate Dry (20% protein)
- Feline Canned
- Marmoset Canned (4522 IU Vit. D₃)
- Omnivore
- Ratite (proven for BOTH breeding & maintenance.)

Hill's
NUTRACEUTICALS

DISTRIBUTORS OF PREPARED EXOTIC ANIMAL DIETS.

We can fill the majority of your feeding requirements economically with one FREE call.

Professional Sales Representatives

- Rob Mueller — Collect — 715-445-3605
- Rich Freitag — Collect — 616-963-3080
- Jerry Houghlan — Toll Free — 800-228-4005

Animal SPECTRUM Inc.

5801 Locust Street
Lincoln, Nebraska 68516
Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-3917

Reptile Amphibian potpourri

CANNIBALISM IN CAPTIVE COBRAS

By
Ted Daehnke, Head Keeper
California Alligator Farm

In nature true cannibalism is a rare occurrence because a species which practiced cannibalism to any great extent would tend to eliminate itself over a period of time. For this reason, most animals have either developed means of avoiding contact, such as the selection of habitat different from that of the adults by the juveniles of a species; or elaborate threat and appeasement behaviors which allow a weaker individual to break off contact with a stronger one without fear of serious pursuit.

The Chinese cobras (*Naja naja atra*) being bred at the California Alligator Farm show a strong tendency towards cannibalism. This may be normal behavior for Chinese cobras, a response to the conditions of captivity, or simply a trait inherent in this particular group.

Accidental cannibalism is not uncommon among captive snakes. Accidental cannibalism might occur when two snakes begin swallowing different portions of the same food item, as a response to the scent of food on a cage mate, or as a response to movement of a cage mate when the scent is in the air. The first case of cannibalism recorded in our Chinese cobras this summer may fit this last set of conditions. The event occurred on feeding day and there was food in the building though no food had been placed in the Chinese cobras cage. The cage contained four mature cobras of similar size and one of these succeeded in overpowering and swallowing one of his cage mates. A meal this size can be handled by a snake under ideal conditions, but these are highly strung snakes and activity outside their display cage keeps them sufficiently agitated to explain the meal being regurgitated within 24 hours.

The second case of cannibalism in this cage occurred this fall with no apparent provocation. The case was observed during a routine security check at 11:00 p.m. on the night preceding feeding day. No food was in the building and to the best of our knowledge, no other stimulus was present to initiate the attack. The snake failed to keep the meal down for more than 24 hours in this case also.

The Chinese cobras involved in these incidents are descended from a single wild-caught pair and their behavior may not be representative of Chinese cobras in general. We would appreciate hearing from anyone who has had experience with Chinese cobras which supports or contradicts our observations. Those wishing to correspond may write to me c/o California Alligator Farm, Box 236, Buena Park, CA 90621.



Keeper's Alert

The first newsletter on computerization of zoo animal records is in preparation. It will be mailed to those who responded to the questionnaire on computers or those who attended the workshop at the AAZPA conference in Phoenix. Anyone who is not on the list but would be interested in receiving the newsletter may contact the editor: Fred Andrus at the San Diego Zoo.



Bird Calls

MANAGEMENT AND BREEDING OF GREEN HERONS AT THE LOUISIANA PURCHASE GARDENS AND ZOO

By
Brett Bannor, Bird Keeper
Louisiana Purchase Gardens & Zoo
Monroe, LA

The colony of green herons (*Butorides virescens*) at the Louisiana Purchase Gardens and Zoo began with four wild-caught birds donated between 1976 and 1979. At present, our group consists of six individuals: a breeding pair, their three most recent offspring, and an unrelated adult.

GENERAL MANAGEMENT

Our herons are kept inside the Bird House in a 7.5m by 3.4m by 2.1m swamp exhibit. An 11.8cm high waterfall at one corner of the display empties into a narrow stream. This flows into a 3.1cm deep pool which constitutes approximately one-third of the floor space. The land area, arranged on several levels, is covered with natural rocks. Vines strung across the enclosure provide a variety of perching sites. Public viewing is through glass on two sides of the exhibit.

Bird of prey meat seems to be the preferred diet of the herons. They are also fed chopped whole fish (usually smelt) and insects; multi-vitamins and extra vitamin B₁ are supplemented.

Sharing the swamp exhibit are a purple gallinule, a purple glossy starling, and a pair of arrow-marked babblers. Although the herons are often aggressive at the food pans, generally they are compatible with the other species. Occasionally there are brief intraspecific squabbles over food and roosting sites.

Despite exhibit modifications, herons continue to fly into the glass when keepers enter the display. This is true of captive-bred specimens as well as of adults who have lived in the exhibit for three years. Fortunately, they fly so slowly that impact is minimal; we have never had a heron injured by such a collision.

BREEDING

Green herons in Louisiana breed from early April to June or July (Oberholser, 1938). In our controlled setting, however, they breed throughout the year. Perhaps this is due to our constant year-round cycle of thirteen hours of light and eleven hours of darkness.

We provide rectangular 4.7cm by 3.1cm by 1.6cm chicken wire nests attached to a wall 13cm above ground. The herons line these structures with plastic plant leaves and a few sticks. One particular nest beside the pool is preferred; few eggs have been laid at other sites.

A clutch of two or three eggs is incubated by both parents for 16 to 24 days. Mean incubation period has been 19.8 days. When caring for eggs, the parents flee the nest at sight disturbances. As soon as the chicks hatch, however, the parents become very protective. They will fly to the nest from other parts of the exhibit to squawk and lunge their heads at intruding keepers.

MANAGEMENT AND BREEDING OF GREEN HERONS AT THE LOUISIANA PURCHASE ZOO
(Continued)

The semi-helpless chicks place their beaks inside the adults' open mouths to receive regurgitated nourishment. Fledging occurs at about 21 days, but for several days prior to this, the growing herons perch on the nest edge. So there is no chance of young birds drowning, the pool is kept drained for a week after the chicks leave the nest.

Most chicks have been healthy, the exception being those hatched between March and July 1981. During that period, our group produced five clutches, but none of the twelve hatchlings survived. Most developed severely deformed legs at nine to thirteen days of age. Attempts at hand-raising these youngsters failed. Unfortunately, at that time the individual herons could not be identified. We, therefore, do not know how many adult birds were responsible for the inflicted offspring. Three of the five problem clutches had a trio of chicks. In all the time we have kept green herons, those were the only instances of more than two eggs per nest hatching. Nevertheless, any attempt to correlate the number of young with the leg deformities is impossible, since the same disfigurement occurred in a nest of only two chicks.

Although the green heron is a common North American bird, it is easily surplused. Herons hatched here have been sent to several collections in the United States and Canada.

ACKNOWLEDGEMENTS

I wish to thank Carl Watson, Diane Omundson, and the entire staff of the Louisiana Purchase Gardens and Zoo for providing assistance, advice and encouragement.

LITERATURE CITED

Oberholser, Harry C. The Bird Life of Louisiana. New Orleans: Department of Conservation, State of Louisiana, 1938.



Keeper's Alert

AAZK T-shirts with the official emblem are now available from the Phoenix Chapter. The price is \$6.75 including postage and handling. Sizes Small, Medium, Large, and Extra-Large are available in two colors: Tan with dark brown logo and Dark Brown with white logo. To order, complete coupon below or copy information and send with check or money order to: Mike Carpenter, 906 N. Hayden, #3, Scottsdale, AZ 85257. Make checks payable to "Phoenix AAZK Chapter". Shirts will be returned by 1st Class mail.

AAZK T-Shirt Order Form

Please send _____ T-shirts at \$6.75 each. COLOR: TAN _____ BROWN _____

SIZE: _____ Small _____ Medium _____ Large _____ Extra-Large

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

INTERNATIONAL FOODS COMPANY

We are growing to meet your needs!



- ★ **BILL MEEKER** (I.F.C. MANAGER)
25 years experience in zoo management and exotic animal nutrition
- ★ **TOM SULLIVAN, Ph.D.** (CONSULTANT)
Over 25 years experience in animal nutrition and research at the Universities of Nebraska, Wisconsin and Arkansas.
- ★ **CRAIG LARMON** (EXECUTIVE VICE PRESIDENT)
10 years experience in business and financial management

We have what it takes to be your animal diet supplier

- A professional staff and modern USDA inspected facilities for dependable service and high quality products.
- A resident nutritionist for product formulation and quick response to nutritional matters.
- Quality frozen diets using only high grade beef originating from live cattle at USDA inspected packing houses.
- Premium quality dry diets manufactured for IFC to exacting specifications by a division of Archer Daniels Midland Company.

You can depend on us for:

- Professional service
- Prompt deliveries
- Nutritionally balanced diets
- Low prices

You DO have a choice

FROZEN DIETS

Carnivore
Bird of Prey
(FINE OR CHUNKY GRIND)
Canine

DRY DIETS

Old World Primate
New World Primate
Omnivore
Ratite



INTERNATIONAL FOODS COMPANY, INC.

6200 North 56th Street • P.O. Box 29345 • Lincoln, NE 68529

CALL COLLECT (402) 466-8271

Tooth Talk

By

EDWARD V. SHAGAM, D.D.S., P.A.
ZOOLOGICAL DENTAL CONSULTANT
127 HIGH STREET
MOUNT HOLLY, NEW JERSEY 08060

This month's selected "Tooth Talk" question is from Woodland Park Zoo Keeper Judie Steenberg from Seattle, WA regarding Prairie Dog dentition, and the problem of incisor overgrowth.

The question is as follows:

1. Is incisor overgrowth a genetic problem and therefore inherited?
2. When a condition of incisor overgrowth occurs, can the teeth be filed or clipped back to bring the teeth into alignment for proper wear?
3. What diet items would provide sufficient wear to prevent this condition, without unsettling nutritional balance?

ANSWERS:

Prairie Dogs, as members of the rodent family, use their incisors, as you probably know, for gnawing. If the incisors are not in proper position, a Malocclusion (bad bite) can occur. As with all dental malocclusions, they are often a combination of genetics and dental development. Certain teeth can also push others to one side enough to cause this poor gnawing positioning. Factors that are genetic often deal with jaw growth. If the lower jaw (mandible) grows more, or less, than the norm, the incisors might miss their incisal contact area. Because prairie dog teeth are growing throughout life, a missed incisal contact area can result in incisor overgrowth due to lack of opposing contact (biting against the tooth or teeth in the opposite dental arch.)

Usually the resident veterinarian or zoological dental consultant can clip back those teeth that appear overgrown before they cause damage. Re-alignment can be done to some extent in other ways as well.

However, as far as diet is concerned, prairie dogs need the same nutritional and dentally functional diet as they might find in the wild. They need to gnaw in order to wear their incisors down, as they would in the wild, so as to compensate for continued incisor growth. Therefore, ask your resident veterinarian to supply gnawing material for your prairie dogs. As to what to use in particular, I think your veterinarian is the one to ask, knowing best the substances, and other species that might be affected in the immediate enclosure area.

(EDITOR'S NOTE: AKF is grateful to Dr. Shagam for graciously sharing his expertise with us. We encourage all keepers to submit your questions on exotic animal dental health and/or problems to Dr. Shagam directly at the following address: 127 High Street, Mount Holly, NJ 08060. He will then forward both the questions and answers on to our editorial offices for inclusion in upcoming "Tooth Talk" columns.)



HILLKEEPER PEEPERS
OR
URINE-FOR-LIFE
(A Fine Art)

By
Lynette Shirley
Mammal Keeper
Dallas Zoo



In a far corner of the Dallas Zoo, there exists a mysterious land known as The Hill, where the hoofstock are beautiful, the work tough, and the keepers a strange and secretive breed.

Each afternoon throughout the rest of the zoo, keepers carry on with their daily chores. But far above the zoo valley, the Hill Keepers engage in an unusual activity that has occurred for twenty-four months--the collecting of urine.

Many rumors and tales abound as to why the Hill Keepers collect the urine. What strange fascination could this liquid hold for them? The real meaning behind this peculiar behavior involves an unusual species of mammal that is the closest living relative to the giraffe--the Okapi (Okapi johnstoni).

Okapi are large mammals belonging to the order Artiodactyla. They average five feet at the shoulder, with a long, extensible tongue and large ears. The body, covered by plush, velvet-like hair, is of a deep mahogany coloration with crisp white stripings on the legs and flanks. This coloration serves as camouglage in the sun-speckled rain forests of Zaire, making field observation difficult.

Observation of okapi in captivity is also difficult due to its scarcity. The total number of okapi in captivity is fifty-six animals (26 males, 30 females), with seventeen in zoological collections around the United States. Of the six okapi at the Dallas Zoo, there are mature females--and it is in these few valuable animals that the significance of urine collecting becomes clear.

In order to determine the breeding condition of each female okapi, individual urine specimens are collected daily and sent to the Research Department of the San Diego Zoo, where each specimen is analyzed to determine estrous cycles and optimum breeding times for each female. This date is crucial to the survival of the okapi in captivity, for political red tape makes the okapi very difficult to obtain from the wild.

The fine art of urine collecting is not as simple as the uninitiated might suppose. It involves time, patience and a warped sense of accomplishment when finally, after hours of anguish, the warm trickle is captured and whisked to the safety of a plastic vial. Thus, having

HILLKEEPER PEEPERS, Continued

secured one vial of the precious liquid, the Hill Keeper marches victoriously on to the two remaining females--only to wait tortuous minutes while they munch hay, slurp water, wander around, stare dumbly, slurp water, and finally...how many days has it been?...Success at last!!!

Sadly though, victory is not always in hand, or in cup as is the case. Many a day goes by without a drop, and the defeated Hill Keeper drags into the office, bleary-eyed and hoarse of voice from hours of persuading, threatening and cursing. But with luck and dogged determination, all the urine specimens are collected and the Hill Keeper gains new strength and renewed patience to endure another day.

So, if you happen to visit the Dallas Zoo and spy this strange breed of keeper sneaking around with bamboo pole and cup in hand--BEWARE! For in its eyes may be the glazed maddened stare of a desperate creature driven to any lengths for success--and that may be you!

Final note: Urine collection is only the first phase of an ambitious project recently begun at the Dallas Zoo, in cooperation with the Brookfield, Oklahoma and San Diego Zoos. As part of the Okapi Management Program and the AAZPA Species Survival Plan, artificial insemination and embryo transplant will be attempted in okapi. The okapi to be used in the breeding project is Miracle, a nine-year-old female incapable of being bred normally due to a severe physical handicap. It has been agreed that embryo transplant offers the best chance of continuing Miracle's genes. Although this procedure has never been attempted in okapi, it involves little risk to Miracle and will play an increasingly vital role in efforts to preserve the fascinating uniqueness of the okapi for the future.



Information Please

The Dallas Zoo has experienced a rather strange pelage color phenomena with some black leopard (Panthera pardus) cubs. Certain cubs were born completely white, although not albino, but progressively turned dark until fully black at approximately 60 days. The white cubs were all from a female imported from Thailand.

I am attempting to locate zoos and parks that have experienced this method of hair color modification. If you have noticed this type of pelage change in black leopards, or any other feline, I would be grateful if you would let me know. If your institution has observed this situation, I would like to collect genetic or background data on those particular animals. Please contact: Hugh E. Pearson, Animal Keeper, Large Mammals, Dallas Zoo, 621 East Clarendon Dr., Dallas, TX 75203-2996.

I am a research associate with the University of California at Santa Barbara involved in a project with Tree Shrews (Tupaia belangeri and T. glis). I am seeking information on tree shrews (any species) in captivity with emphasis on diets, behavior (stress response) and especially breeding successes or lack thereof--past or present. Please send any information to: Jeanette Levell c/o Central Vivarium--UCSB, Dept. of Biological Sciences, Santa Barbara, CA 93106.

INFORMATION NEEDED: Our zoo is requesting information on any documented cases of parvo virus in primates. We have strong evidence that parvo virus was the cause of death of one of our collection's colobus monkeys. Please send information to: Dr. Jack Bostwick, Consulting Zoo Veterinarian, Sunset Zoological Park, City Hall/11th & Poyntz Ave., Manhattan, KS 66502.

Exhibit Options

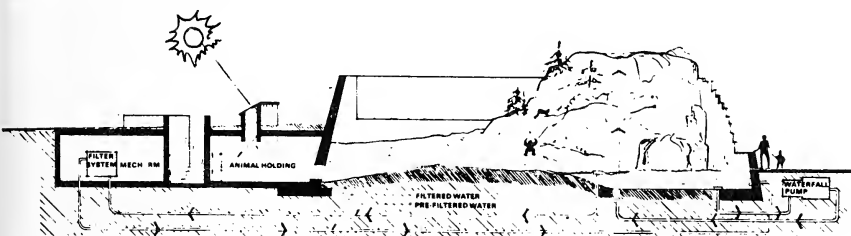
NATIONAL ZOOLOGICAL PARK TO OPEN
MONKEY ISLAND PARADISE IN SPRING '83

By
Sandi Smith, OPA Intern
National Zoo, Washington, D.C.

Imagine discovering an island where a waterfall cascades down a mountain of rock and splashes into a large pool. Within a forest of pine trees, you spot a small colony of Barbary macaques, the dominant male overseeing the social group. Soon, you won't need to imagine. Eight Barbary macaques are waiting for their new home, Monkey Island, scheduled to open this spring.

Monkey Island won't be a true island but a peninsula with a water-filled moat, 20-feet wide and three-feet deep, to prevent escape of the animals. A 25-foot rock mountain with trees and a waterfall will rise on one side of the exhibit. Pine trees and other plants will grow throughout the rest of the peninsula. A special feature above the exhibit will be a 360-degree viewing area for Zoo visitors. At night, the monkeys will be kept in a holding area beneath Monkey Island to allow their keepers to feed them and give other day-to-day care.

The Monkey Island exhibit has been in the Zoo's plans for 20 years. Like other renovation projects, it's been constructed to conform to the Zoo's Master Plan for providing natural settings for the animals. Collection manager Bill Xanten explains, "Monkey Island will allow us to show a large group of social primates in a representation of their natural environment where Zoo scientists can study social and reproductive behavior while the animals are on public view."



Monkey Island Exhibit -- Courtesy of NZP Office of Construction Management

Barbary macaques are large monkeys, members of the genus *Macaca*. They are the only monkey living in Europe (Gibraltar), and they are also found in North Africa. They have played an unusual role in English history. According to tradition, when the last monkey disappears from Gibraltar, the English will lose their strategic fortress at the entrance of the Mediterranean. During World War II and other times of crisis involving Gibraltar, the English have brought more monkeys from North Africa to assure their continued residence.

Barbary macaques adapt well to Washington's weather, and over the years, the Zoo has been very successful breeding the species. "Our present group constitutes a basic monkey social system," notes Xanten. "They squabble a little, but they have established a social hierarchy and are interesting to observe. Monkey Island will give the colony a lot more room to grow."

NZP TO OPEN MONKEY ISLAND PARADISE IN SPRING '83, Continued

Xanten has two concerns about Monkey Island: training the monkeys to come inside on command and protecting the plants from the monkeys. He hopes that if the dominant male can be trained to come inside, the others will follow. Keeping monkeys from eating the plants may be more difficult. "We'll have lots and lots of plants to establish a good root system. We hope there will be too many plants for the monkeys to cause significant damage. As the monkey population increases, the plants should become well enough established to withstand them," says Xanten.

Phase I of Monkey Island, including the outside shell, glass screen, moat, heating system, utilities and holding area, is near completion. Phase II, the surfacing of Monkey Island, is also just about finished. In the near future, the macaques will be moved into the holding area so they will feel comfortable by the time they are let out into their new home next spring, when Monkey Island is officially opened to the public. Eventually, other kinds of animals may join the macaques on Monkey Island. But for the first year, it's going to be a paradise just for monkeys.



FUND-RAISER IDEA STRESSES GOOD HEALTH

By

Debbie Stecher, Unit Keeper
Woodland Park Zoological Gardens, Seattle, WA

Looking for a fund-raiser with a new twist? At Woodland Park Zoo, our AAZK Chapter offers an Aerobic Dancercise class for its members and for other interested zoo personnel. The class is an ongoing fund-raiser for the chapter, and a fun way to stay in shape.

Our program works like this: the zoo lets us use a meeting space on the zoo grounds, making the class convenient to all. Classes are offered twice a week for eight weeks. We meet on Tuesdays and Thursdays at 12:15 p.m. Cost of the eight week class is \$16 for members and \$24 for non-members.

A zoo keeper's good health is mandatory. We are called upon, daily, to do heavy lifting and walking--sometimes many miles. Observing animal behavior, we face the elements for hours. Some of us are found in the strangest positions, repairing displays, or hanging nest boxes! We work long, hard hours and sometimes we don't eat right, or get the proper exercise, so an aerobic exercise program for keepers is a natural.

Strength and flexibility are not enough to achieve total fitness--above all you need endurance. Experts have determined that only aerobic activity will improve the stamina of the pulmonary and cardiovascular systems. Given the highly physical nature of our work and the potential for injury, participation in an aerobic exercise program will increase the fitness of zoo employees, thereby enhancing work performance and reducing the risk of injury. All this and fun too! Our management agreed to donate a half-hour to employees toward aerobic exercise so we don't have to work over-time.

If your chapter wants more information on how to start your own class, please feel free to contact me for further information.

(Editor's note: Since the time the program was started at Woodland Park, the Aerobic Dancersize classes have made \$300 for the Chapter. The funds were designated to pay Chapter member's conference fees. Seven members have been reimbursed for conference fees in 1982; six for the AAZK Toronto Conference and one for the Vet-Tech Conference in New Orleans.)



Legislative News

Compiled by Kevin Conway

PROPOSED ADDITIONS TO CITES APPENDICES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates international trade in certain animal and plant species, which are listed in appendices to CITES. The United States, as a Party to CITES, may propose amendments to the appendices for consideration by the other Parties.

The USFWS invites comments and information from the public on species that have been identified as candidates for U.S. proposals to amend Appendix I or II. This is in addition to an earlier request for information concerning possible changes in the status of certain North American species that are already listed.

Information Received for Animals

In response to the February 16 notice, the Service received extensive information from Mr. Bill Clark of the Hai-bar Arava wildlife reserve in Israel, who recommended including the African wild ass (Equus asinus africanus) in Appendix I. This subspecies is represented by perhaps 3,600 individuals, most of them in Ethiopia. The Director of the Wildlife Conservation Organization of the Ethiopian Government has informed the Service of his support for this proposal.

Dr. Alan H. Shoemaker of the Riverside Zoological Park suggested transferring the Central American river otter (Lutra annectans) from Appendix II to Appendix I, but mentioned that he could not provide supporting data. The Service presently lacks information showing a need for this change and will not include it in its final proposals unless sufficient information is received in response to this notice.

TRAFFIC (U.S.A.), an organization that monitors the international trade in wild animals and plants, submitted information in support of proposals to transfer the following species or subspecies from Appendix II to I: the yacare caiman (Caiman crocodilus yacare), the red-eyed macaw (Ara rubrogenys), the caninde macaw (Ara caninde), the Indian pangolin (Manis crassicaudata), the Malayan pangolin (Manis javanica), and the Chinese pangolin (Manis pentadactyla). TRAFFIC (U.S.A.) also submitted evidence in support of a proposal to include the collared peccary or javelina (Tayassu tajacu) and the white-lipped peccary (T. albirostris) in Appendix II. With the possible exception of the two macaw species, further information on population status is needed to determine if these proposals are appropriate.

Dr. George Archibald of the International Crane Foundation suggested including the wattled crane (Bugeranus carunculatus) in Appendix I, on the grounds that it is acutely endangered and in trade. The Service is seeking information to substantiate the need for this listing.

LEGISLATIVE NEWS, Continued

Dr. Wayne King, Director of the Florida State Museum, recommended that the black softshell turtle of Mexico (*Trionyx ater*) be removed from Appendix I because it is reported to be genetically swamped by *Trionyx spiniferus emoryi*. According to H. Smith and R. Smith (1980), in their Synopsis of the Herpetofauna of Mexico, the listed species is no longer genetically or morphologically distinct. The Service is seeking scientific information to determine if this has occurred.

Summary of Potential U.S. Proposals Outside of the 10-Year Review

For the purpose of seeking further information, the Service now considers the following animals to be candidates for U.S. proposals to amend Appendix I or II:

Mammals:

Manis crassicaudata [Indian pangolin]--App. I
M. javanica [Malayan pangolin]--App. I
M. pentadactyla [Chinese pangolin]--App. I
Tayassu albirostris [White-lipped peccary]--App. II
T. tajacu [Collared peccary or javalina]--App. II
Equus asinus africanus [African wild ass]--App. I

Birds:

Ara caninde [Caninde macaw]--App. I
A. rubrogenys [Red-fronted macaw]--App. I
Bugeranus carunculatus [Wattled crane]--to remain on App. II pending further study

Reptiles:

Caiman crocodilus yacare [Yacare]--no change proposed pending further study
Trionyx oter [Cuatro cienagas softshell turtle]--Delisting proposal denied

---Federal Register
Vol. 47, No. 173

IMPLEMENTATION OF FISH AND WILDLIFE CONSERVATION ACT OF 1980--FINAL RULE

This rule implements the Fish and Wildlife Conservation Act of 1980 which provides for Federal funds to States for developing, revising and implementing, in consultation with the appropriate Federal, State and local agencies, plans for the conservation of fish and wildlife. It clarifies requirements set forth in the Act and merges with them other requirements placed on grantees and grant-administering agencies by other laws, Executive orders and policies such as Office of Management and Budget. This rule became effective on 13 December 1982.

---Federal Register
Vol. 47, No. 219

REVIEW OF SPECIAL RULES ON SEA TURTLES

The USFWS have been requested to review the current ban on commercial U.S. trade for certain sea turtle species. An upcoming meeting of CITES will consider whether certain populations of sea turtles should be traded for commercial purposes. In light of these activities, the Services hereby announce their intent to review Special Rule 50 CFR 17.42[b] and 50 CFR 222 Subpart D on sea turtle species listed as threatened under the Endangered Species Act with particular attention on whether or not to allow U.S. trade in certain sea turtle products according to CITES.

The Service has decided to review their rules on Threatened sea turtles for the following reasons:

[1] Suriname and Reunion have submitted proposals to ranch (rear in a controlled environment specimens taken from the wild) green sea turtles for consideration at the fourth regular meeting of CITES to be held in Botswana during April 1983. If the Parties deem these populations to be no longer endangered and to benefit by ranching with the intention of trade, these populations could be transferred to Appendix II.

Species included in Appendix II may be traded internationally for commercial purposes provided that the Management Authority of the country of export issues an export permit. An export permit can be issued when the Scientific Authority of the country of export advises, among other things, that such export will not be detrimental to the survival of that species and the Management Authority of the country of export is satisfied that the specimen was not obtained in contravention of the laws of that country.

[2] Appendix I animal specimens which are "bred in captivity" for commercial purposes are deemed to be included in Appendix II according to Article VII.4 of CITES. This provision of Article VII was the subject of a resolution by the Parties of CITES in 1979. Questions have been raised by the government of the Cayman Islands and the United Kingdom Management Authority about the application of this resolution to certain Appendix I species, such as those with long generation periods. It has been proposed that this issue be discussed by the CITES Technical Experts Committee and that it be addressed in Botswana. Green sea turtles are among the species that could be affected by a resolution on this matter.

[3] On 22 January, 1982, the Pacific Legal Foundation and the Association of Rational Environmental Alternatives filed a petition for rulemaking with the Services (47 FR 13917). The petitioners proposed implementation of a mariculture exemption for the trade prohibition for green sea turtle products by means of a permit provision in the regulations or a special rule.

[4] The Cayman Turtle Farm, Ltd. (CTF) has requested the Services to allow items from farm-produced turtles to accompany tourists back to the U.S., to allow farm products to be transshipped through the U.S. and to allow farm products to be imported into the U.S. for commercial purposes. During direct discussions between officials of the Cayman Islands and U.S. Government officials, and at hearings before the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Committee on Merchant Marine and Fisheries of the House of Representatives, the Cayman Islands Government gave assurances that it would prevent any further addition of wild sea turtles or eggs to CTF, and would impose a numbering and documentation system on traded items.

The purposes of this notice are to announce the Service's intent to reconsider allowing commercial import of maricultured sea turtle products into the U.S.

---Federal Register
Vol. 48, No. 1, Jan 3, 1983



STAFF AND TECHNOLOGY EXCHANGE SURVEY

Please answer each question completely, giving specific details where appropriate. Please print or type your answers. Feel free to attach another page if you haven't room for a complete answer in the space provided. As soon as possible, please submit your completed questionnaire to: *Elandra Aum, Staff Exchange Team, Woodland Park Zoo, 5500 Phinney Ave., North, Seattle, WA 98103.*

1. Personal information: Age _____ Number of years as zookeeper _____
Name of institution at which I am now employed _____

Last year of schooling completed: High School 1 2 3 4
College 1 2 3 4
Post-Grad _____

I have worked with (circle all that apply):
Invertbrates Fish Marine Mammals Birds Herps Land Mammals
Other (please specify) _____
2. Have you ever participated in a staff exchange? YES _____ NO _____
3. Does your institution now have a staff exchange program? YES _____ NO _____
4. Do you want to participate in an exchange with another institution?
(If NO, please continue with question #12)
YES _____ NO _____ Not Sure _____
5. Should length of time on the job affect the possibility of participating in an exchange? YES _____ NO _____ Not Sure _____
6. With which institution(s) would you like to exchange? _____

7. What would be your purpose(s) in participating in an exchange? _____

8. If you were paid your normal wage during the term of exchange, would you be willing to be responsible for your own travel and living arrangements, including expenses (perhaps using the Keeper Accommodations List)? YES _____ NO _____ Not Sure _____
9. What, in your opinion, is the ideal length of time to derive maximum value from working at another institution on an exchange? _____

10. Would you be willing to submit a written report of your experience? _____ Present a talk on your experience? _____ Look at implementing at your institution, changes in facility/procedures, based on ideas you get from your work during an exchange? _____ Contribute from your learning in another way? (Please specify). _____
11. What value, if any, do you see in having an active staff exchange program? _____

STAFF AND TECHNOLOGY EXCHANGE SURVEY, Continued

12. Have you ever had trouble finding information on any areas of captive animal management technology that you have researched? YES___NO___
13. Would you make use of a publication giving access to previously unpublished papers/articles? YES___NO___Not Sure___
14. Would you be willing to contribute to such a publication, papers/articles you have written and not published previously? YES___NO___Not Sure___
15. Do you feel that a reference of this type would be a useful tool in your job? YES___NO___
16. What topics should such a publication cover in order to be a useful tool?_____
- _____
- _____



POLAR BEAR SURVEY

Dear AAZK Members:

Recently this survey on the management of polar bears was sent to zoos in the U.S., Canada and around the world. Since response to such questionnaires is always risky, I would like to ask you to take a few minutes to answer the questions. Even if your zoo does not have polar bears, I would appreciate it if you would just drop me a line indicating your institution does not have polars. Participation in this study will make it a success. Why not take a few minutes now to answer the questions and return them to me. Thanks for your help in this matter.

Randy McGill
Principal Zookeeper
Detroit Zoological Park
P.O. Box 39
Royal Oak, MI 48068-0039

Does your institution have polar bears?_____ How Many?_____

Male to Female ratio_____ Age of Animals_____

How long has the species been exhibited at your zoo?_____

What is their Diet?_____

For what period of time do the bears have access to the feed?_____

Give a brief description of their exhibit:_____

_____ (use additional sheet as needed)

POLAR BEAR SURVEY, Continued

Size of pool: _____

Cleaning methods and frequency of cleaning pool: _____

Have you had any breeding success? _____

Age of breeding animals when introduced to one another: _____

Description of denning techniques: _____

Have you experienced any incidents of polars seriously injuring or killing one another? Please describe briefly (age and sex of animals involved, age of fighting animals when introduced to each other, length of time together, etc.): _____

Any other comments or information: _____

NAME OF REPORTING INSTITUTION

NAME OF STAFF MEMBER COMPLETING SURVEY

Would you like to receive a copy of the survey results? YES _____

NO _____



Book Review



THE RAT: A Study in Behavior

By S.A. Barnett
Published by University of Chicago Press,
5801 Ellis Ave., Chicago, IL; 1981
\$11.00 (paperback)

Review by Ann Norton
Dept. of Laboratory
Animal Resources
Colorado State Univ.

Although the title indicates that Barnett is writing for laboratory researchers, his book would be interesting and useful to anyone working with animals, regardless of the species. The rat was chosen for this book as an example of behavior studies in general because of the amount of work that has been done with it.

The first part of the book is devoted to rat behavior and physiology: brain structure and function, home range and territoriality, social organization, feeding behavior, mating behavior, and parental care. The chapter on brain physiology could be confusing without some background in neurophysiology, but the information presented is not essential for a good understanding of the rest of the book.

The second half of the book discusses common behavioral research, using the rat as a model: methods and analysis of habit formation, "instinct" and "drive", "emotion", pathology, and genetic variation in behavior. Throughout this section Barnett describes problems that arise in experimental design, interpretation of data, and terminology currently used in behavior research.

Anyone studying animal behavior, as formal research or as a part of daily animal care, would benefit from reading The Rat. Barnett's style makes the reading enjoyable, even though it is very technical at some points. An extensive bibliography is included and is referred to throughout the text. Photographs, diagrams, and illustrations help to clarify experiments and behaviors analyzed. There is also a glossary of terms, which defines words as they are used in this book.



Information Please

Information is needed on the breeding behavior, sexual differences and soft part color changes of the Marabou Stork (Leptoptilos crumeniferus). Any information on pair formation and pre-breeding behavior would be especially helpful. Please contact the Bird Department, Knoxville Zoological Park, Box 6040, Knoxville, TN 37914.

RESEARCH ASSISTANCE NEEDED: Request for mites and ticks from reptiles! Preserve in isopropyl alcohol if 70% ethyl alcohol is not available. Please send ectoparasites to: Sue Barnard, Senior Reptile Keeper, Atlanta Zoological Park, 800 Cherokee Ave., SE, Atlanta, GA 30315.

Persons knowing of a home for a handsome year-old crow which cannot fly due to a previously healed wing fracture are urged to contact me. It has the educational potential of affording the public a close-up view of a character typically seen at a distance. As an alternative to euthanasia, I am in search of a home with a good quality of life. Any possible leads I could follow up would be greatly appreciated. Diane Lord, 70 Cheney Dr., Storrs, CT 06268, (203) 429-3990.

The job listings from the AAZPA Newsletter were late in arriving this month and therefore could not be included in this edition's "Opportunity Knocks" section. We regret any inconvenience this may cause.

The following job listings were sent directly to the editorial offices of Animal Keepers' Forum for inclusion in this job listings section.

LECTURER/KEEPER/HERPETOLOGY...\$780.00 a month to start. Send resume to: Ken Earnest, Curator, California Alligator Farm, 7671 La Palma Ave., P.O. Box 236, Buena Park, CA 90620.

ANIMAL KEEPER (Primate/Elephant)...Washington Park Zoo, Portland, OR. Performs responsible animal husbandry duties in the care of elephants and primates. Assists with breeding and research projects and participates in the development and implementation of improved animal care and exhibit plans and procedures. Applicants must have experience in the breeding and husbandry of elephants and primates and demonstrate the knowledge and abilities necessary to perform the duties of the position. College level course work in animal science, biology, or related subjects relevant to the care of exotic animals is desirable. Applications must reach the Metropolitan Service District by 2 March 1983. For additional information and requirements contact: Cathy Vandehey, Metropolitan Service District, (503) 221-1646.

**o
p
p
o
r
t
u
n
i
t
y
k
n
o
c
k
s**



MOVING?

Please send change of address to:

Dolly Clark, Administrative Secretary
National Headquarters
American Association of Zoo Keepers
635 Gage Blvd., Topeka, KS 66606

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo	Work Area	Special Interests
-----	-----------	-------------------

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INS1

Animal Keepers' Forum

Smithsonian Institution Libraries



KAKA 4-22-80 III

Dedicated to Professional Animal Care

MARCH 1983

Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
 Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
 Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
 Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
 Steve Taylor, Louisville Zoo, Louisville, KY 40213

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
Patti Kuntzmann, Philadelphia Zoo	Randy Adolph, St. Louis Zoo
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
Judie Steenberg, Woodland Park	Frank Kohn, Audubon Park Zoo
<u>Historical Committee</u>	<u>Awards Committee</u>
Larry Sammarco, Lincoln Park	Mike Crocker, Dickerson Park Zoo
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
Kevin Conway, NZP/CRC, Front Royal	Kevin Conway, NZP/CRC, Front Royal

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
Karen Starr Wakeland	Ellen Leach, Woodland Park Zoo
<u>Staff Exchange</u>	<u>Program Library</u>
Elandra Aum, Woodland Park Zoo	Mike Crocker, Dickerson Park Zoo
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
Bernie Feldman, Miller Park	Mike Coker, Topeka Zoo
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
Oliver Claffey, Metro Toronto	Steve Taylor, Louisville Zoo
<u>Diet Notebook</u>	<u>Membership Directory</u>
South Florida Chapter, Miami	Pat Sammarco, Lincoln Park
	<u>Keeper Data Survey</u>
Mary Slaybaugh, San Antonio Zoo	Dave Orndorff, Sea World Shark Institute

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Ed Roberts	Walter D. Stone Zoo	ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D.C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Laurence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's artist is Pamela Sardinias Campa, a student at Santa Fe Community College Teaching Zoo in Gainesville, FL. Her pen and ink rendering is of a Kaka (Nestor m. meridionalis). Thanks, Pamela!

Scoops and Scuttlebutt

AAZK BOARD APPROVES NEW APPOINTMENTS TO COMMITTEES

Oliver Claffey, Metro Toronto Zoo, has been appointed to serve as the Coordinator for KAL (Keepers Accommodations List) replacing Chris Parker. All AAZK members are reminded and encouraged to take advantage of the KAL when traveling. Many thanks to Chris for the fine work put in on the KAL and welcome to Oliver!

Craig Moran, Dickerson Park Zoo, Springfield, MO. has been appointed to the Professional Standards Committee replacing Mike Crocker. Mike will continue as Program Library Chairman and Chairman of the Awards Committee. Congratulations to Craig on his appointment!

Diane Forsyth, Akron Zoo, has been named to the AAZK Education Committee headed by Judie Steenberg of Woodland Park Zoo, Seattle. This Committee has been actively investigating educational options for AAZK members and all are urged to follow their progress through monthly reports in AKF.

ANIMAL KEEPERS' FORUM NAMES NEW ASSOCIATE EDITOR

The editorial staff of AKF is pleased to welcome its new Associate Editor Alice Miser. Alice will be replacing Connie Cloak in this position. We would also like to take this opportunity to thank Connie for her assistance and support during her tenure as associate editor.

Alice began her career in the zoo field at the Santa Fe Community College Teaching Zoo in their Biological Parks Technology program. While at Santa Fe, she became involved in AAZK and served as an officer for the local Chapter. She also directed a locally-televized zoo program which was developed and produced by the AAZK Chapter and presented a paper at the 1980 National AAZK Conference in Montgomery.

After graduation from Santa Fe, Alice toured 15 zoos in the southern and midwestern U.S. before taking up her present position as a Keeper at the World Famous Topeka Zoo in March of 1981. She works with a number of animal species including elephants, Bornean orangutans and Mandrill Baboons. Alice currently serves as Treasurer for the Topeka AAZK Chapter.

GESTATION BOOKLET INFORMATION REQUESTED FROM MEMBERSHIP

Gestation Booklet Chairman Mike Coker is still in need of additional data for this project. All members are urged to participate in this project by sending the following information to Mike c/o Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606: Order, Family, Common Name, Gestation (days), Litter Size, Breeding Season, and Age of Sexual Maturity. So, please check into the records of the species you work with and contribute this necessary information as soon as possible.



Births & Hatchings

MOORPARK COLLEGE.....*Nancy Childress*

Births and hatchings in the Exotic Animal Compound at Moorpark College, Moorpark, CA in recent months include: 3.0 Common marmoset, 1.0 Dromedary camel, 1.4 Bengal tiger, 5.2 Coyotes, 0.0.4 Racoon, 1.0 Golden racoon, 0.0.7 Coatimundi 0.0.7 Peacock, 0.0.10 King snake, 1.0.1 Indian muntjac, 5.2 Wild boar and 3.2 Pygmy goat.

ATLANTA ZOOLOGICAL PARK.....*Alan Sharples*

September 1982 saw the birth of our eleventh Celebes Crested Macaque, a female named Rebecca. A male Polar Bear was born on 25 December and is being hand-raised. Other births and hatchings include 0.0.1 Himalayan black bear (DNS), 2 Leopard gecko, 3 Red-eared sliders, 6 Amazon tree boas, 19 Morelet's crocodile and 3 Diamondback terrapin.

WOODLAND PARK ZOOLOGICAL GARDENS.....*Mary Bennett*

Births and Hatchings for October and November 1982 include: 1.0 Axis deer, 0.1 Nilgai, 0.0.2 Patagonian cavy, 0.0.1 Palawan peacock pheasant, 0.0.2 Leopard gecko, 3.1 Sinaloa milk snake and 0.1 Llama. December 1982 additions were: 0.1.2 Lions, 0.0.1 Patagonian cavy, 0.0.1 Greater galago, 1.0 Potoroo and 0.0.1 Tamandua.

BRONX ZOO.....*Margaret Price*

January 1983 brought the following Births and Hatchings at the Bronx Zoo: Birds - 0.0.1 Mauritius pink pigeon, 0.0.1 Penguin, 1.0 Rothchild's mynah, 1.1 Raggiana bird of paradise, 1.0 Queen of Carola's bird of paradise, 1.1 Lesser bird of paradise, 2.0 Green junglefowl, 2.0 Red and white rail, and 1.0 Malayan banded pitta; Reptiles - 1 Russells viper and 19 Common anaconda; Mammals - 0.0.1 Ring-tailed lemur, 0.0.4 African spotted mouse, 0.0.3 Wild cavy, 0.0.3 Pen-tailed bettong, 0.0.2 Cotton-top marmoset, 0.0.1 Lesser galago, 0.0.3 Spotted grass mouse, 0.0.1 White-tailed gnu, 2.2 Blackbuck, 0.1 Blesbok, 1.0 Brow-antelared deer, 1.0 Reeves muntjac.

DALLAS ZOO.....*Tamara Jones*

Births and Hatchings at the Dallas Zoo for January 1983 include: Mammals- 0.1 Axis deer, 1.1 Pygmy goat (DNS), 0.1 Zebu (DNS), 1.0 Grizzly bear (DNS), discovered born during 1982, 0.0.8 Mexican fruit bat; Birds- 2 White-cheeked turaco, 2 Yellow-fronted canary (1 DNS), 9 Gouldian finch; Reptiles- 10 Green tree pythons.

While on a five-week journey through the wild terrain of Kenya, James B. Murphy, Curator of Reptiles, acquired 28 Highcasqued chamaeleon (*Chamaeleo hohneli*) and 1.1 Jackson's chamaeleon (*Chamaeleo jacksoni*). These fine specimens will add to our already overwhelming collection of reptiles.

BIRTHS AND HATCHINGS, Continued

BROOKFIELD ZOO.....John Stoddard

January 1983 B&H include: 0.0.1 Black-billed weaver, 0.0.1 Blue-grey tanager, 0.0.1 Kookaburra, 0.0.2 Barn owl, 0.0.3 Striped grass mouse, 0.0.9 Spotted grass mouse, 0.0.3 Spiny mouse, 0.0.3 Cuis, 0.0.8 White-toothed shrew, 0.0.1 Rat kangaroo and 0.0.1 Golden lion tamarin.

LINCOLN PARK ZOO.....Randy McMahon/Susan Moy

The following are the B&H for January 1983 at the NEW LINCOLN PARK ZOO: Mammals- 0.0.1 Sugar glider, 0.0.2 Cotton-top marmoset, 0.0.1 Titi monkey, 0.0.2 Owl monkey, 0.0.2 Agouti; Birds- 0.0.2 Double-striped thick-knee (1 DNS), 0.0.2 Nicobar pigeon, and 0.0.1 Star finch (DNS).



Coming Events

AAZPA SOUTHERN REGIONAL CONFERENCE

March 20-22, 1983

Memphis, TN

AAZPA CENTRAL REGIONAL CONFERENCE

March 17-29, 1983

Albuquerque, NM

GREAT LAKES AAZPA REGIONAL CONFERENCE

April 10-12, 1983

Evansville, IN

Call for Papers: All AAZPA members interested in presenting a paper at the Conference to be held at Mesker Park Zoo should contact Mark S. Rich, Director, Mesker Park Zoo, Bement Ave., Evansville, IN 47712.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 24-26, 1983

Pittsburgh, PA

You are cordially invited to attend. The Pittsburgh-Greentree Holiday Inn has been selected as the conference site. Registration forms and further information may be obtained by contacting: Regina Greeb, Pittsburgh Zoo, P.O. Box 5250, Pittsburgh, PA 15206. A full program is being planned but can only be accomplished through your participation. The conference will include workshop presentations, trips to the Pittsburgh Zoo and Aviary and will conclude with a banquet. ALL KEEPERS ARE INVITED TO ATTEND!

5TH ANNUAL MEETING AMERICAN SOCIETY OF PRIMATOLOGISTS

August 7-10, 1983

Lansing, MI

For registration and further information contact: Dr. David M. Taub, Yemassee Primate Center, P.O. Box 557, Yemassee, SC 29945.

CONTINUING KEEPER EDUCATION

*By Judie Steenberg, Coordinator
AAZK Education Committee*

First, thank you to Bruce Clark, Toledo, for providing this section with a title and offering to do illustrations for the Committee. Two illustrations have been submitted for our logo which the Committee will be deciding on.

PROJECT UPDATE: The three projects are moving along and going through the time consuming process of becoming organized, and being molded into a definite direction.

--Dwight P. Knapik, Apprentice Keeper at Calgary, has provided the Committee with a good selection of the training materials being used there. He has also provided us with an overview of how the program is conducted.

--Chris Parker, formerly Head Keeper at Metro Toronto Zoo, has sent a copy of his recently printed "Manual of Zoo Keeping". An initial review shows this manual to be an excellent reference.

Keeper Safety video tapes & pamphlet:

--Wayne Buchanan, Woodland Park Zoo, is currently collecting reference materials and working on the script for the tape. This project will get underway around March 1st. The Puget Sound Chapter Keeper Training Committee and the APZG Administration have offered to give Wayne their support and assistance on the project. The Chapter recently raised \$600.00 to purchase additional video equipment for the Zoo which will be available for the taping.

Reference Search: Mary McLaughlin, Roger Williams Zoo, and Jenny Rentfrow, Mason, MI, are both busy working through the monumental task of coming up with a working reference for Zoo Keepers. It will be several months before this project sorts itself out and settles into a usable format. As mentioned previously, you can help by providing them with a copy of any bibliographies you have relating to animal keeping, or on a particular species. Jenny recently advised the Committee that they have access to a computer which will be a tremendous help in this project.

GIVERS AND TAKERS:

We are all a little of both. For the next few minutes, think of what you can give to the profession of Zoo Keeping; in your immediate job, at your Zoo, and to AAZK. Not everyone has been around long enough to be able to make a major contribution, but everyone involved in animal keeping has something to give. The reason you are an animal keeper in your business. The fact that you are a keeper, and are reading this article, indicates that you take your work seriously and support the idea of professional animal care. Most of us have one or more people who helped us achieve our position in the animal keeping profession through their advice, support, philosophy, training, or maybe setting us on the right track--correcting us when we made a mistake. Many of us have reached a point where, although we continue to learn and improve our techniques and capabilities to perform our work, we should be making an effort to share our experiences and knowledge. When was the last time you made an effort to help someone sincerely interested in becoming an animal keeper? Attendants, volunteers and assistant keepers are all potential Zoo Keepers. There are more

Continued on page 76

MAINTENANCE OF THE EASTERN CORAL SNAKE (*Micrurus f. fulvius*) ON AN ARTIFICIAL DIET

By
Fred Antonio, Curator
Santa Fe Community College Teaching Zoo

On 23 September 1980, a 75 cm female Eastern Coral Snake (*Micrurus f. fulvius*) was field collected in Alachua County, Florida and donated to Santa Fe Community College Teaching Zoo for exhibit purposes. Since *M. fulvius* is a local venomous snake which can be confused with the sympatric Scarlet Snake (*Cemophora coccinea*) and Scarlett Kingsnake (*Lampropeltis t. elapsoides*) it necessitates exhibition for public education. Accompanying graphics should at least stress identification of the coral snake and the conservation of the nonvenomous mimics.

Micrurus fulvius is a semifossorial elapid which is difficult to exhibit due to their tendency to burrow into substrate and wedge behind or under cage props. Teaching Zoo students experimented with a variety of substrates which included sand, soil, pea gravel, sawdust, and mulched vegetation. These proved unsatisfactory as the snake could successfully manipulate these substrates and if too deep become obscured from view or if too shallow, wedge the substrate to one side exposing the bottom of the aquarium. Flat Georgia green range rock was incorporated into the forward portion of the exhibit in an attempt to position the snake by creating areas of tactile security. This also proved unsuccessful as small rocks could be displaced and the snake would scrape off outer scale portions (stratum corneum) on heavy rocks which resulted in areas of dulled skin. Additionally light was reduced in the front portion of the exhibit but the snake did not consistently seek the lower light intensity.

An acceptable remedy was reached by laying 2 mm sheet plexiglass (20 x 22cm) over a 2 cm deep sawdust substrate in the front portion of the exhibit. The snake then resided under the plexiglass in excellent public view. This strategy has been successful in exhibiting the neotropical worm lizard *Amphisbaena alba* (Mehrtens, 1962), tropidophid snakes (Edwards, 1969), and some members of the Milk Snake (*Lampropeltis triangulum* sp.) complex.

In Florida *Micrurus fulvius* is strongly ophiophagous with lizards comprising only a small percentage of the diet (Jackson and Franz, 1981). Since it is not always possible to acquire proper food items (*Diadophis*, *Tantilla*, and *Ophisaurus*), an experiment was established to test the feasibility of maintaining *Micrurus* via tube feeding.

Initially various gruels were tested using combinations of Portagen, Nutrical, Raptor Diet, monkey chow, dog chow, and supplemental vitamins. Due to the general unavailability of some of these products and the time required to prepare a satisfactory gruel, it was decided to implement Gerber's strained beef baby food as the total diet. This product had the advantage of being easily acquired at a minimal cost and no preparation was required prior to tube feeding.

A relatively safe and simple procedure for tube feeding was established both for teaching purposes and to reduce stress for the snake. Plexiglass tube restraint (Almandarz, 1978; Fowler, 1978; Murphy, 1971; Radcliffe, 1975; Savage, 1973) was accomplished using a 25 cm plexiglass tube (16 mm inside diameter) held by tongs (30 cm - 100 cm).

MAINTENANCE OF THE EASTERN CORAL SNAKE ON AN ARTIFICIAL DIET, Continued

The tube feeding apparatus consisted of a 45 cm length of aquarium air line tubing (3 mm inside diameter) connected to a 20 cc syringe. Once the snake was restrained in the plexiglass tube, he was enticed to bite the end of the air line tube which had been filled with baby food and coated with a water soluble gel. The feeding tube was then gently passed approximately half way down the snake's body length and the desired quantity of food was administered. Following this procedure the snake was placed in a 75-liter container overnight to check for regurgitation.

The *Micrurus* in this study was maintained in this fashion for 26 months. During this time tube feeding occurred 44 times ($x=2$ week feeding interval), 525 cc of beef baby food was administered ($x=12$ cc per feeding), and 19% of the feedings resulted in partial regurgitation ($x=23\%$ of administered diet was regurgitated). Regurgitation usually occurred when more than 15cc of diet was offered.

The above procedure proved to be a satisfactory method for maintaining an exhibit coral snake. It would certainly be preferable to maintain *Micrurus* on a natural diet, but that is rarely possible as may be indicated by a decline in both the number of specimens and the number of zoos recording *Micrurus fulvius* in their inventories during the last three years (Slavens, 1980, 1981, 1982). In 1982 only 9 specimens in 7 zoos were recorded.

The author believes the educational benefits gained by the public rationalize the described tube feeding procedure if appropriate graphics accompany the exhibit. The graphic possibilities of presenting theories of mimicry (Gehlbach, 1972; Grobman, 1978; Green and McDiarmid, 1981; Janzen, 1980; Wickler, 1968) and warning coloration vs. camouflage (Smith, 1969; Smith, 1975) would certainly stimulate the viewing public to acquire an appreciation for these remarkable animals. This is particularly crucial in regions where tri-colored snakes are killed due to ignorance.

Acknowledgements: Students and staff of Santa Fe Community College Teaching Zoo graciously contributed to various aspects of this study. Special appreciation is due J.B. Barker, A.R. Boy, G. Frank, A. Miles. C. Payne, and A. Wiggins whose persistence in tube feeding greatly contributed to the success of this study.

Literature Cited

- Almandarz, E. 1978. Physical restraint of reptiles. pp. 130-132. in: Zoo and Wild Animal Medicine, M.E. Fowler Editor-in-Chief. W.E. Saunders Co., Philadelphia.
- Edwards, M.S. 1969. Notes on some tropidophid snakes in captivity. Int. Zoo Yb. 9:53-54.
- Fowler, M.E. 1978. Restraint and Handling of Wild and Domestic Animals. Iowa State Un. Press, Ames, Iowa.
- Gehlbach, F.R. 1972. Coral snake mimicry reconsidered: the strategy of self mimicry. Forma et Functio, 5:311-320.
- Greene, H.W. and R.W. McDiarmid. 1981. Coral snake mimicry: does it occur? Science, 213: 1207-1212.
- Grobman, A.B. 1978. An alternative solution to the coral snake mimic problem. J. Herpetol. 12 (1); 1-11.
- Jackson, D.R. and R. Franz. 1981. Ecology of the Eastern Coral Snake (*Micrurus fulvius*) in northern peninsula Florida. Herpetologica, 37 (4); 213-228.

INTERNATIONAL FOODS COMPANY

We are growing to meet your needs!



- ★ **BILL MEEKER** (I.F.C. MANAGER)
25 years experience in zoo management and exotic animal nutrition
- ★ **TOM SULLIVAN, Ph.D.** (CONSULTANT)
Over 25 years experience in animal nutrition and research at the Universities of Nebraska, Wisconsin and Arkansas.
- ★ **CRAIG LARMON** (EXECUTIVE VICE PRESIDENT)
10 years experience in business and financial management.

We have what it takes to be your animal diet supplier

- A professional staff and modern USDA inspected facilities for dependable service and high quality products.
- A resident nutritionist for product formulation and quick response to nutritional matters.
- Quality frozen diets using only high grade beef originating from live cattle at USDA inspected packing houses.
- Premium quality dry diets manufactured for IFC to exacting specifications by a division of Archer Daniels Midland Company.

You can depend on us for:

- Professional service
- Prompt deliveries
- Nutritionally balanced diets
- Low prices

You DO have a choice

FROZEN DIETS

Carnivore
Bird of Prey
(FINE OR CHUNKY GRIND)
Canine

DRY DIETS

Old World Primate
New World Primate
Omnivore
Ratite



INTERNATIONAL FOODS COMPANY, INC.

6200 North 56th Street • P.O. Box 29345 • Lincoln, NE 68529

CALL COLLECT (402) 466-8271

MAINTENANCE OF THE EASTERN CORAL SNAKE ON AN ARTIFICIAL DIET, Continued

- Janzen, D.H. 1980. Two potential coral snake mimics in a tropical deciduous forest. *Biotropica* 12 (1): 77-78.
- Mehrtens, J.M. 1961. A successful technique for exhibiting amphisbaenids. *Int. Zoo Yb.* 4:123.
- Murphy, J.B. 1971. A method for immobilizing venomous snakes at Dallas Zoo. *Int. Zoo Yb.* 11:233.
- Radcliffe, C.W. 1975. A method for force-feeding snakes. *Herp. Rev.* 6 (1):18.
- Savage, S.B. 1973. The housing and force-feeding of Emerald tree boas, (*Corallus caninus*). *Int. Zoo Yb.* 13: 156-157.
- Slavens, F.L. 1980, 1981, 1982. Inventory of live reptiles and amphibians in North American collections. Published annually, printed by F. and E. Slavens, Seattle, Washington, USA.
- Smith, N.G. 1969. Avian predation of coral snakes. *Copeia*, 1969: 402-404.
- Smith, S.M. 1975. Innate recognition of coral snake pattern by a possible avian predator. *Science* 187: 759-760.
- Wickler, E. 1968. *Mimicry in Plants and Animals*. McGraw-Hill Book, Co., New York, NY.



Keeper's Alert

ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession.

The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. Presently any correspondence to the PSC should be broken down as follows:

Kevin Conway
NZP/Conservation & Research Center
Front Royal, VA 22630

MA, NH, VT, RI, ME, NY, PA, DE, CT,
WV, VA, MD, D.C., NC, SC, TN, KY,
GA, AL, MS, LA, and FL.

Craig Moran
Dickerson Park Zoo
3043 North Fort
Springfield, MO 65803

OH, KS, NE, ND, SD, IN, IL, MI, MN, WI,
IA, MO, AR, TX, and OK.

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

WA, OR, CA, AZ, NM, CO, NV, WY, ID
and MT.

CAPTIVE REARING OF BARN OWLS AT THE MEMPHIS ZOO

By

John Stokes
Asst. Curator of Birds
Memphis Zoo, Memphis, TN



On a moonless night, in a field next to the old farmhouse, a meadow mouse has begun his nightly feeding. The mouse and his counterparts have been raiding this field for several weeks now, feasting on the now ripe soybeans. Of course, the farmer has sprayed for insect pests and weeds, but he has not been able to control the marauding rodents. But, alas, he does have help. For listening in a nearby tree to all this scurrying and feeding is a Barn Owl (*Tyto alba*). With its super hearing and chemically enhanced vision, the barn owl is one of Nature's most superbly adapted rodent traps.

The owl, an old female, has now begun to triangulate to get an exact fix on the mouse's position. By bobbing her head, she can sense slight sound differences accurately enough to hunt prey without any visual clues at all. This is due to the fact that the barn owl has offset ear openings--one ear opening pointed slightly upward while the opposite ear opening is pointed slightly downward--which allows sound to reach one ear quicker than the other, thus allowing a "fine-tuning" effect of this bird's stereoscopic hearing.

In addition to the owl's fantastic hearing, is it's amazing night vision. Thanks to a chemical called visual purple, the owl can discern images in light so low that it is impossible for humans to see. Both the hearing and vision in combination make the barn owl highly accurate against various rodents and small birds.

The owl now has determined the location of the mouse and launches from the limb. Sailing along on silent wings, the barn owl constantly monitors the mouse sounds as she closes in for the strike. By the information she is receiving in her ears, she even knows what position the mouse's body is in and adjusts her talons accordingly. Before the mouse has a chance to react, the owl has pounced upon him. With a few quick squeezes of her talons, the mouse is dispatched. She then launches into the air, transferring the mouse from her feet to her beak and flies up to an abandoned grain silo where she has two waiting owlets...

Unfortunately, this scene is becoming less and less common in many parts of North America. Although the Barn Owl is found all over the world, its population across the U.S. has become precarious in some areas. Several factors have contributed to its decline, but the main problem it faces is loss of habitat. With great tracts of forest being cleared for agriculture, this removes the old nest trees that the barn owl uses. It is ironic in this case that if only a few old trees were left, the barn owl could thrive in this agricultural area. Also, they have lost nesting habitat with the advent of modern barns, which aren't nearly as open as the "old" barns, which in turn denies the barn owl access for nesting. Pesticides, too, have caused the owls a bit of a problem. Being a predator and at the top of the food chain, any prey consumed containing pesticides soon causes a buildup in the owl's system. This then leads, of course, to pesticide-related reproductive problems which have been well documented in other predatory birds such as the Bald Eagle and Peregrine Falcon, to name a couple. So, unless something is done to help the barn

CAPTIVE REARING OF BARN OWLS AT THE MEMPHIS ZOO, *Continued*

owl in these areas, it may disappear altogether from several regions of North America. Barn owls have become increasingly rare in west and middle Tennessee--exactly because of the aforementioned problems. And if something is not done to reverse the trend, then the barn owl may, indeed become a rare sight in Tennessee.

This is where the Memphis Zoo has stepped in to help. Since 1969, the Memphis Zoo has been captive-rearing barn owls. Only this year, 1982, has the Memphis Zoo been able to begin a restoration project for the barn owl. In the following paragraphs, I will attempt to outline our breeding efforts from the beginning to the present, which spans some 13 years.

The Memphis Zoo currently has one breeding pair of barn owls which were donated on May 8, 1967. They were fledglings at the time and with their healthy appetites they grew quickly. For about two years, they were kept in our old "contact area" in a parrot-style flight cage (long and narrow). They were given a "doll house" box for roosting during the day. Not much breeding activity was observed and it was probably not known at the time that we had a pair.

In 1969, the owls were moved on display to a converted primate cage. This cage had a dimension of 12'x12'x8' tall. They were given a nest box of 18"x18"x12" tall. It had (has) an opening in the lower middle front of 6"x6" and had (has) a hinged roof to permit checking the eggs and the young. The box was attached to the side of the cage some 6½' off the ground. In 1969, they nested. We indeed had a pair--for they laid five eggs and hatched two youngsters. In 1970, they produced five youngsters. Sometime in 1971, the owls were moved to a "Raptor Run" and were given a cage 5'x5'x7' tall. Again, they were given the same nest box, but this time the nest box was placed on the ground. They quickly adapted to this arrangement and again went to nest. The birds produced a couple of clutches of eggs, averaging 8-10 eggs and raised to fledgling age an average of 2-4 youngsters (generally, the smaller youngsters were cannibalized by their larger siblings). The pair stayed in this cage for some six years and produced an unknown number of young (our record keeping at the zoo at that time was not as complete as we would have liked it to have been).

In 1977, the pair was moved to the birdhouse and kept in a wire cage approximately 5'x8'x5' high. Again the pair began to nest in the nest box when it was placed on the ground. It is amazing that once this pair began to breed and produce eggs and young, no matter where we put them and as long as they had their box, they would reproduce. Their primary diet for most of this time was Nebraska Brand Bird of Prey Diet, lab rats and mice. The rats and mice were especially important when the pair had young.

Renovation of the birdhouse took place in 1978, and the pair was again moved, this time to the reserve birdhouse. They were given a cage of approximately 6'x 6' x12' high and this time the nest box was placed at about the 10' level in the left rear corner of the cage. Additional roosting and feeding platforms were added at various levels. The pair again went to nest (these birds have never ceased to amaze me). Not much courtship has even been observed from this pair and only courtship vocalizations consisting of a series of rapid "cheer-ups" (sounding somewhat like the twitter of a chimney shaft) that lasts for a minute or more were heard. The pair was fed the same diet and this time produced two youngsters. All of the young up until this time were shipped to various zoos, with their locations being rather foggy as far as where they are now.

CAPTIVE REARING OF BARN OWLS AT THE MEMPHIS ZOO, *Continued*

I decided that despite the fact that the barn owls had raised youngsters in various cages, that all the previous cages they had lived in were inadequate. They needed something larger that was more secluded and soon the search was underway. I soon found the perfect spot behind the reserve birdhouse. Located there was a small tool shed of some 5'x4'x8' in height which was built of concrete blocks. Inside the shed were several shelves of varying levels. On the top shelf I attached a nest platform of 2'x2' dimensions having a 2"x2" lip all the way around. This prevented the rolling of eggs over the edge. On the middle shelf was placed the old faithful nest box and the lower shelf was left bare. In the front of the shed was built an 8'x12'x6' high flight cage constructed from 2"x4" cedar boards and covered and covered with 1"x1" galvanized wire. Also, a galvanized tin roof covered 3/4 of this cage, allowing one end open for weathering. Two feeding platforms were attached, one of the frame itself and the other a small wire stand in the middle of the cage. The original shed door was cut in half to allow easy access for the owls but also protected them in the event of nasty weather. Sand was added to the cage floor, but natural vegetation has been allowed to grow in the small flight area.

It apparently took the owls a while to adjust to their new home. For about a year they did little in the way of reproduction. In 1979-80, they laid several clutches of eggs that were either infertile or the embryos died in the shells. Something was wrong. They were now in the best cage that they had been in since coming to the zoo, but they were not reproducing. During 1979-80, we had switched our Bird of Prey diet from Nebraska Brand to another brand which was severely less palatable and really did not resemble meat. I really had begun to suspect that this dietary change was causing our problems but had no way to prove it.

Everyone, including me, was now beginning to believe that the barn owls' breeding days were over and that they should be released. It seems that somebody wanted to use their cage for parrots! Finally in the fall of 1981, we re-welcomed an old friend to the Memphis Zoo--Nebraska Brand Bird of Prey Diet. We had managed to negotiate a higher quality B.O.P on the basis of good palatability equals less waste. That seemed to do the trick. In February of 1982, the barn owls began laying eggs again---this time on the nesting platform above the nest box. I crossed my fingers in anticipation, hoping I was right about the dietary change. Finally, on 10 March 1982, the first barn owls in about two years hatched at the Memphis Zoo. Still, I was anxious because there were six eggs yet to hatch. Soon, another egg hatched and another and yet another. Four barn owls in total were hatched.

We immediately began to supplement with rats and mice in hopes that the parents would be able to feed all the young. This, however, did not stop the cannibalism and by fledging time only one youngster survived. We, in the meanwhile, had received three orphaned barn owls from the wild (their nest tree was blown down in a storm). We were raising them in a large sky kennel. They were approximately three weeks of age. Earlier this year, in anticipation of the upcoming hacking season, two hacking boxes were built. Both were identical and had features that allowed us to feed the birds without them seeing us.

Finally, at about seven weeks of age, the three from the wild and the remaining barn owl hatched by our pair, were placed in the hacking box atop the reserve birdhouse for a two-week stint. Mid-town Memphis, where the

CAPTIVE REARING OF BARN OWLS AT THE MEMPHIS ZOO, *Continued*

zoo is located, offers excellent habitat for barn owls, and they haven't nested in this area for probably twenty years. The owls were fed laboratory rats and mice and B.O.P. diet. During the day, the foursome would huddle in a corner of the hacking box and around dusk the birds would begin to move around and utilize the upper perches that allowed viewing of the release area. After two weeks in the hacking box, on 28 June 1982, at 8:00 p.m., the four barn owls were released. It took about 45 minutes for all of the owls to leave, each flying to a nearby tree to get a good look at the new world of which they had just become a part. Food was left on top of the hacking box for two weeks. The meat was replaced in the late afternoon to prevent drying by the sun and contamination by flies. Since release, three owls (I'm not sure if it is three separate birds or the same one) have (or has) been seen on three occasions. The first sighting was the day after the release. This bird was in a tree by the Lion House and was being severely pestered by the local passerine population. The second sighting was some two weeks later near the hacking box. The last sighting was some four weeks after release at our waterfowl exhibit.

I hope that these owls survive and nest in the area in the future, but, of course, only time will tell. We plan on doing this whole procedure again next year to further enhance the breeding chances of the population in the area. But no matter what the outcome is, we do know that we have indeed tried to help in the restoration of one of nature most efficient rodent traps, the barn owl.

BIBLIOGRAPHY

The Book of Owls by Leslie Wayne Walker

Published by: Alfred A. Knapp, Inc.
New York, N.Y., 1974



CONTINUING KEEPER EDUCATION, *Continued from page 4*

people than ever wanting to become Zoo Keepers. Let's make every effort to help those who make it into the ranks become the best keepers they can.

What can you give...? Your very best effort in your particular job, assistance, information, guidance, support and direction to those who will follow us.

Keeper training begins with you; working with a trainee can do a lot to help sharpen your skills.

Next month we will start sharing some of the information we've collected on Keeper Training programs.

GESTATION BOOKLET:

Have you reviewed your files for the data asked for last month? The booklet can't be completed without data...and that has to come from us. Let's make 1983 a banner year for helping AAZK Projects. If you haven't done your homework yet, make plans and give yourself a deadline to collect the Gestation booklet data within the next two weeks.



Election.....83

NOMINATIONS FOR AAZK BOARD OF DIRECTORS



Dear AAZK Members:

Here is the nomination information for the Board of Directors election. Three (3) seats are up for re-election - those held by Mike Maybry, Steve Taylor and Jill Grade, whose terms expire in December of this year. Nominations must be postmarked no later than April 30. The committee will then verify each nomination received and a short biographical sketch on each nominee will be prepared. During the first week in July, ballots and the biographical sketches will be sent to each Professional member, in order to elect the three new members.

Please send the completed nomination information to:

Lynne Villers, NEC Chairperson
Indianapolis Zoo
3120 E. 30th St.
Indianapolis, IN 46218

DUTIES OF THE BOARD OF DIRECTORS

For a more detailed explanation of the expanded duties of the Board, refer to the Papers of Incorporation--available upon request from the National Office.

- 1) Select, appoint or remove officers, committees, agents and employees of the Association, includes prescribing powers and duties.
- 2) To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a majority of the Board.
- 3) To formulate policies, rules and regulations in accord with the Constitution and By-laws.
- 4) To uphold the Constitution of AAZK and the policies of the Association.
- 5) To appear at Board meetings, to accept Board assignments and to devote time to communications pertinent to all Board Business, including answering correspondence promptly and efficiently.

QUALIFICATIONS FOR NOMINATION

- 1) Nominee must be a Professional Member of AAZK and must have been a member of the Association for at least a year.
- 2) Nominee must be presently employed as an animal keeper/attendant by a recognized zoo or aquarium in the U.S. or Canada and must have been in the zoological field for at least two years.

NOMINATION PROCEDURE

- 1) List name of nominee, address, phone and institution.
- 2) A brief statement by the nominator as to why the nominee warrants election to the Board.
- 3) A biographical sketch by the nominee with the following data:
 - (a) Professional background, places of employment, titles, length of service
 - (b) Educational background
 - (c) Membership in AAZK: National and local chapters, number of years, offices held, involvement on activities, AKF contributions, etc.
 - (d) Membership in affiliate organizations: AAZPA, NWF, Audubon, etc.
 - (f) Other information that nominee feels to be pertinent

This information should be signed by both the nominator and the nominee. It should be understood that false or lacking information requested will void the nomination.

Thanks for your help and understanding. I'll be keeping in touch as the election draws closer.

Lynne Villers, NEC Chairperson



Exhibit Options

THE USE OF CLEAR STRIP CURTAINS AS WEATHER BARRIERS FOR ZOO ANIMALS

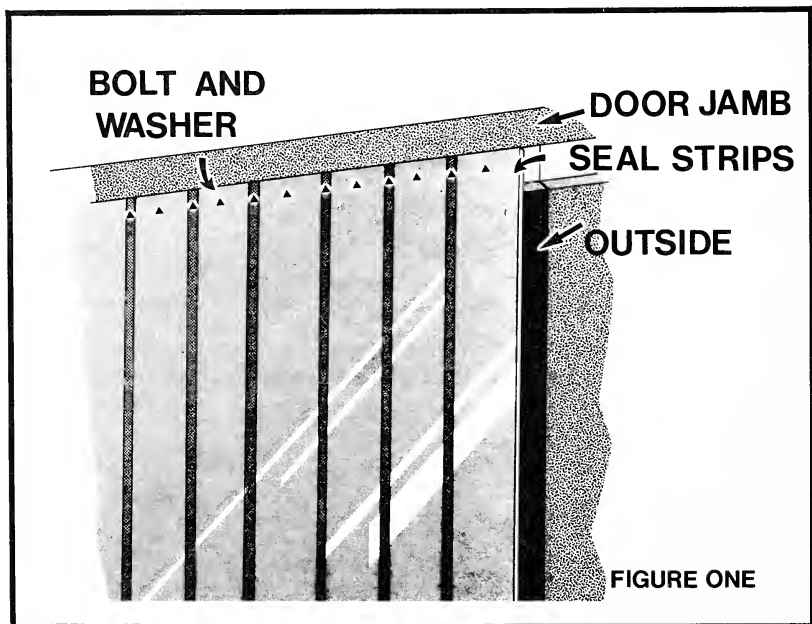
By
Robert R. Peel
and
B.D. Klassen
Calgary Zoo, Calgary, Alberta, Canada

Clear strip PVC curtains were used to improve environmental conditions in an enclosure housing zebra and addax. This article describes the methodology and results over a one-year period at the Calgary Zoo.

A cement structure, bermed on one side and heated by a gas space heater, has been used to house Grant's zebra (*Equus b. bohmi*) since the early 1960's. The facilities seemed to provide an adequate shelter, however, there were problems with a drinking container freezing over, and an obvious heat loss factor from two openings. (In extremely cold weather the zebra were locked in the barn.)

The addition of Addax (*Addax nasomaculatus*) to this area prompted further concerns to improve the microenvironment and make conditions more suitable. Would the cold weather be harmful to the Addax? What would be the fate of neonate or juvenile animals during the winter?

The idea of applying PVC curtains to the zebra barn originated from observations on their use at a municipal garage. At this facility the curtains were used to environmentally seal off one area from another.



THE USE OF CLEAR STRIP CURTAINS AS WEATHER BARRIERS FOR ZOO ANIMALS

Continued

Materials & Methods

The distributor lists a number of industrial uses for PVC curtains: traffic doorways, exterior loading docks, storage areas, freezer separators, garbage chutes, etc. The curtains are made with soft, flexible overlapping vinyl strips that have excellent tear resistance and tensile strength that perform in a temperature range of -40°C to 65°C.

In November 1981, the two doors leading to an outside enclosure on the zebra half of the barn were environmentally sealed by surface mounting overlapping PVC strips (Figure 1). In the following year, the two doors on the Addax half of the barn were also equipped with the curtains. Food was used to encourage entry.

Results

Both species accepted the curtains with minimal resistance. With the zebras, it was first necessary to pin back some of the strips, creating a smaller opening. As the animals became familiar with the feel, it was possible to fully suspend the strips. Initially the Addax approached the curtains cautiously, horning for an opening. As they became familiar, they passed through chin up.

Over the past year there has been some yellowing of the material. The manufacturer has assured us that this is a normal process for PVC strips exposed to sunlight, and it had not interfered with function. Occasionally it is necessary to wash the curtains to improve visibility. The curtains have withstood animal abuse and remain undamaged. (Toxicity of the material was considered prior to application.)

The problem of drinking containers freezing is solved. The warmth encountered when entering the barn has negated further concerns of housing zebra and addax over our cold Calgary winters.

Discussion/Recommendation

Similar concepts to improve microenvironment have been used elsewhere at the Calgary Zoo. For some animals, a solid flap door is used. Primates, for example, often adapt well to this type (Ungulates typically have a flight distance. Perhaps visibility is more important for these species.)

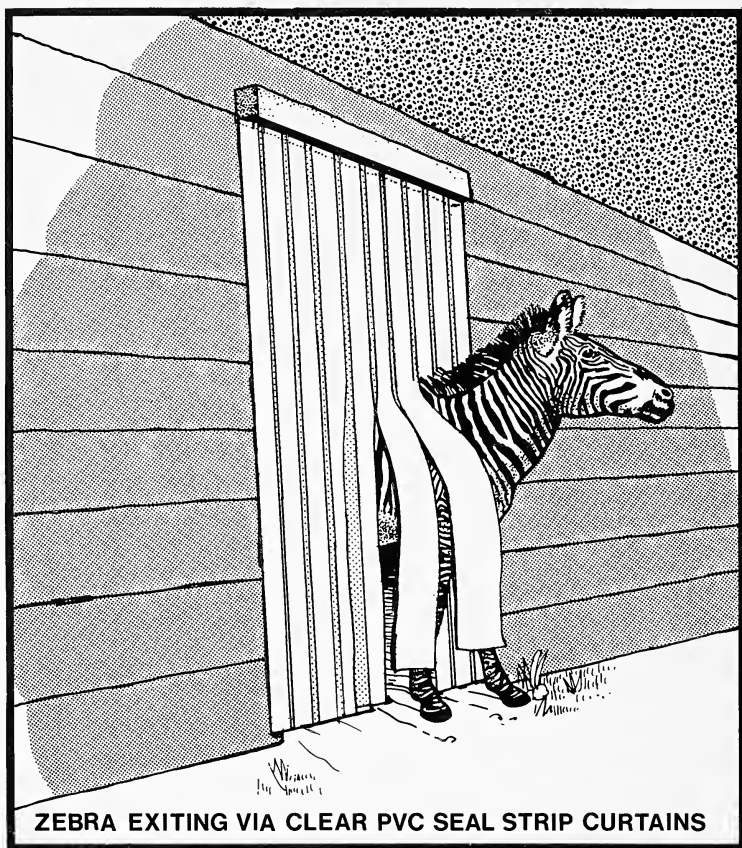
For grizzly bear, we have used a heavy gauge rubber material cut in strips with no overlap. However, this material lacks cold weather flexibility, and without an overlapping strip, much of the heat retention is lost.

PVC curtains have been used for kangaroo species and Cape Barren goose with good results.

Future plans include:

- (1) experimenting with other species to determine acceptability.
- (2) experimenting with other applications, for example, in a facility where the only heat source is from the animals and bedding.

As fossil fuels increase in cost, there is more pressure on Zoo design to incorporate energy efficient concepts. The use of flaps is one factor that helps limit the costs of construction and maintenance.



Since strip curtains have a broad industrial use, local suppliers are often available. We feel we can recommend a similar application for other zoo animals.

Products Mentioned in Text

Super Seal Strip Curtains

Distributed By:

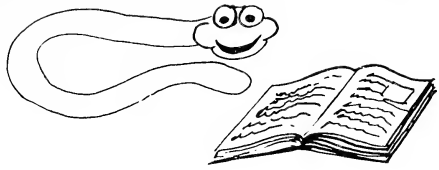
Pacific Warehouse Equipment Ltd.
#6 - 3850 19 Street N.E.
Calgary, Alberta T2E 6V2
CANADA

Acknowledgement

We wish to acknowledge the support of co-workers and especially thank Grant Leier for the illustrations.



Book Review



Review by Mary L. Swanson
Keeper, Fresno Zoo

The Spotted Hyena: A Study of Predation and Social Behavior

By Hans Kruuk
Published by The University of Chicago Press
5801 S. Ellis Ave., Chicago, IL 60637; 1972
335 pp, 58 photos; numerous drawings, softbound
\$8.95

Hans Kruuk studied the spotted hyena (*Crocuta crocuta*) for four years in the Serengeti where the hyena is the most numerous carnivore. This book is his scientific treatise on that study. But don't let that put you off--although it is a thorough scientific study, it is a very readable book to anyone interested in animals.

Topics covered by Kruuk include the hyena's habitat and ecology, morphology, feeding habits and relations with other carnivores, social behavior between hyenas and their behavioral adaptations. In addition to specific study of the hyena, Kruuk includes discussion of the Serengeti ecosystem, and the anti-predator behavior of gazelles, zebra and other prey against different carnivores.

This is a thorough study of a much maligned animal. Kruuk was among the first to show that the spotted hyena is not merely a scavenger--but that it is a skillful, efficient predator whose kills are often scavenged by others, including the African lion.

As a keeper whose charges include a pair of spotted hyenas, I find this book useful in explaining hyena behavior to the public, such as the greeting ceremony of mutual genitalia examination, or the meaning of levels of tail elevation. The most commonly asked question is "Why are they taller in the front?" Kruuk has a simple answer--one reason is they can run away faster from a fill carrying big haunches of meat, weighing as much as 15 kg.

I highly recommend this book as a useful reference on hyenas. Keepers (and others) will gain an admiration for hyenas after reading this book.



Keeper's Alert

There is a supply of free Animal Data Transfer Forms for all Zoos and Aquaria, courtesy of AAZK. Contact: Bernie Feldman, Miller Park Zoo, 1020 S. Morris Ave., Bloomington, IL 61701.

Chapter

By Patti Kuntzmann
Chapter Affairs Coordinator

Dear Chapters,

I must apologize for my lack of correspondence in the past couple of months. I have been busu preparing for relocation. Effective 1 April, 1983, I will be living in Chicago. Any correspondence should at that time be directed to the following address: Patti Kuntzmann, 6918 N. Clark St., Chicago, IL 60626.

I hope to hear from you all on a regular basis. I would like to ask you all to bear with me a couple of months longer while I get settled in Chicago. Thank you all for your patience.

Patti Kuntzmann
Coordinator for Chapter Affairs

WELCOME!

To our newest chapter, Assiniboine Park Zoo, Winnipeg, Manitoba, Canada. They are now in the process of getting chartered. They have started off with a whopping 36 members! The officers are:

President.....Bob Debets
Vice President.....Phil King
Secretary.....Janice Martin
Treasurer.....Harold Masters

Welcome aboard!

Portland AAZK Chapter

As of November 1982, the officers are:

President.....Stanley Held
Vice President.....Mike Keele
Record/Secry.....Jill Mellen
Computing/Secry.....Jay Haight

The Portland chapter is really busy these days. They split the cost of a subscription to "Animal Behavior Abstracts" with their education and Animal Mangement departments for the library. They donated money to the National Audubon Society for their successful campaign for reauthorization of the Endangered Species Act. They also held an annual picnic and they selected an honorary member of the year who was Jan Hixon. The Chapter members sent letters to the Argentinian and Japanese consulates protesting the slaughter of penguins for gloves and meat. Great Work, Portland!

News

Moorpark College AAZK Chapter
Newly elected officers of the Moorpark College Chapter of AAZK are:

President.....Robin Silverman
Vice President.....Janet Meade
Secretary.....Nancy Childress
P.R. Director.....Glenn Pederson

Arkansas AAZK Chapter

This past summer they sponsored a "Keeper For a Day" raffle. The idea was fostered by an announcement in AKF and the benefits cannot be measured in dollars, according to the chapter. They have gained one highly competent adult volunteer and two dedicated explorer scouts out of their ten winners. The chapter is trying to raise money to purchase a pair of giant anteaters for the zoo. It will take a long time, but with a lot of determination and dedication, they will do it!

As of January 1983, Arkansas Chapter officers are:

President.....Mark Dameron
Vice President...Debbie Jackson
Secretary.....Chris Rasums
Treasurer.....Kelli Westbrook

CHAPTER NEWS, Continued

Oklahoma City AAZK Chapter

The Keepers at the Oklahoma City Zoo have formed an AAZK Chapter at that institution. They have held two meetings and have elected the following officers for 1983:

President.....John Walczak
Vice President.....Diane Hoch
Sec/Treas.....Penny Foldenaur
Lecture Chairpersons
 David Comsilk and
 Laura Bottaro

In December the Chapter held a lecture featuring John Buettner speaking on Old and New world vultures.

Atlanta AAZK Chapter

As of January 1983, the officers are as follows:

President.....Alan Sharples
Vice President.....Pay Maluy

In December the Chapter raised funds to purchase land for La Planada, a project of the World Wildlife Fund. They raised enough money to purchase 13 acres. Congratulations and good luck, Atlanta!

Puget Sound AAZK Chapter

Puget Sound has already formed eight subcommittees for the '84 conference. They are already on their way to a great conference. Fund raisers include aerobic dance classes on lunch hours, elephant weigh-ins, Christmas cockroach count, speakers group, white elephant sale, and zoo bowl. The money made has been used for a portable tape recorder, cassettes, library projects and taping the International Snow Leopard Conference. They are also using funds to purchase up-to-date video equipment for the zoo.

We can't wait to see what's next--you guys are really on the ball!

Rio Grande Chapter, Albuquerque, NM

The chapter's primary source of income is the operation of two soft drink machines on the zoo grounds. They have also sold carnations on Mother's Day at the annual concert. Father's Day featured a "Have your picture taken with a zoo animal" project and the Chapter has also sponsored a "Spend A Day With A Zookeeper" raffle. Keep it up Albuquerque!

Toronto AAZK Chapter

First, I would like to express my gratitude and my congrats to you for a job extremely well done at the conference. We all enjoyed ourselves and as usual learned a lot. It was obvious that a lot of hard work and dedication went into having such a good conference. And you people did have a good one!

The officers as of November 1982 are as follows:

President.....Oliver Claffey
Vice President.....Chris Parker
2nd V.P.....Marilyn Cole
Secretary.....Karen Mottram
Treasurer.....Neville Parker

The chapter paid the National and local dues for senior keeper Ken May, who celebrated 25 years as an animal keeper. Congratulations, Ken!

The chapter plans to continue its winter evening get-togethers. They will show wildlife documentaries, as well as hold book raffles. They are planning a display case to be erected inside the zoo's front entrance showing information about the AAZK and the keeper's role in the zoo.

Wouldn't it be great if everytime you visited a zoo in another part of the country or the world, there was a display like this at the entrance? Keepers are too often the forgotten part of the zoo, and they are one of the most important parts. I think a display like this would educate the public as to how significant the keepers are.

Think About It Chapters!!!



Conference..... 83

FIRST CALL FOR PAPERS

Papers are requested for the 1983 AAZK National Conference. Suggested topics are:

1. Historical aspects of zoos and zookeeping.
2. Other topics of general interest pertaining to the field of zookeeping.

Papers will be limited to 20 minutes with a five-minute question/answer period. The registration fee for the conference will be reduced for those people whose papers are accepted. Please submit an outline or abstract by 15 July, 1983. Send to:

Bob Berghaier
AAZK Conference
Philadelphia Zoo
34th St. and Girard Ave.
Philadelphia, PA 19104

America's first zoo is proud to host the 9th annual AAZK National Conference. The Philadelphia Zoo and the city of Philadelphia both boast many firsts. The Zoo has achieved the first captive breeding of the orang-utan, cheetah, trumpeter swan, and Siberian tiger among others. The Penrose Research Laboratory, established for the study of animal health and disease as an aid to understanding the diseases of man, was the first of its kind in any zoo.

The city of Philadelphia was the first town in the New World to be planned and was also the first capital of the United States. The Academy of Natural Sciences was the first scientific society of natural history established in America. The first American university was the University of Pennsylvania and the first World's Fair was hosted by the city of Philadelphia. And, of course, the first American zoo opened here in Philadelphia in 1874.

The Philadelphia Zoo is located on 42 acres in Fairmont Park, the largest urban park in the United States. It is approximately 1½ hours from the Bronx Zoo, 3 hours from the National Zoo, and 1 hour from Atlantic City. The city of Philadelphia offers its visitors a variety of attractions including Independence National Historical Park, New Market, the Liberty Bell Pavillion and the Philadelphia Museum of Art. Fine dining and evening entertainment abound in Philadelphia with its many restaurants and clubs.

Look for your Conference registration form and more information in the April issue of Animal Keepers' Forum. Hope to see you in October!

---Philadelphia Zoo AAZK Chapter
Conference Coordinating Committee



A.A.Z.K.

NATIONAL CONFERENCE

OCT. 2-6 1983

UNIVERSITY CITY HOLIDAY INN

PHILADELPHIA PENNSYLVANIA



PHILADELPHIA ZOO

AMERICA'S FIRST ZOO

GRASS ROOT GENETICS...Part Three

ANIMAL BREEDING

By
Dora Jacobs, Keeper
Rio Grande Zoo, Albuquerque, NM

Breeding, in its broadest sense, is simply reproduction. If left to their own devices, animal populations automatically breed. They will also usually maintain a stable population for optimal survival under prevailing conditions. They will incidentally produce some inferior offspring which will be largely eliminated before they reach breeding age. They will also incidentally produce variant offspring which will live to breed because the variant trait is incidental to survival. They will furthermore produce variant offspring which will do better than the main stock because the variant trait is an improvement. All this takes a lot of animals and a lot of time.

Selective breeding by human beings can preserve a species that is approaching extinction. It can also create several distinctive subpopulations which are to varying degrees different from each other. For example, breeds of dogs and pigeons exhibit an enormous variety of types derived from a common stock. Or instead, selective breeding can deteriorate or destroy a species or breed. Waltzing mice would be wiped out by predators in the wild.

All breeding should be for the purpose of improvement or preservation. Wise breeding for the betterment or survival of a species or breed is done by a combination of techniques carefully applied over time by knowledgeable people.

Random breeding will tend to duplicate wild breeding if done on a large enough scale. This tends to be wasteful of time and animals, not to mention money.

We constantly hear emotional statements about inbreeding and outcrossing. People keep saying, "The Irish Setter has gone to the dogs because of too much inbreeding." Garbage! The Irish Setter has gone to the dogs because of too much breeding, period. Genes are genes and they don't care whether they are related or not. It only matters whether they are alike or different, useful or detrimental. Double up on good genes and you get good offspring. Double up on bad genes and you get turkeys whatever the species. Double up on lethal genes and there's no more problem because the offspring will never make it to breeding age, if indeed they make it to birth or hatching. There's no more problem, that is, unless the parents are the last individuals left of their kind.

Pair a sick gene with a healthy gene, and some of the offspring will be healthy, some will die, and the rest, about half, will be healthy but carry on the sick gene to their offspring. This is how a defect like hip dysplasia can spread through a breed of dogs in one generation through the use of a popular stud.

To hear some people talk, you would think inbreeding automatically turned up defects that neither parent had, creating freaks every time. There are occasionally mutations in all kinds of breeding. That is how new breeds are started, but usually nothing can crop up that wasn't there all

GRASS ROOT GENETICS -- ANIMAL BREEDING, Continued

along, only maybe it was hidden in a carrier that didn't actually show it. Inbreeding is the best way to find these defects, and then we should have the sense not to breed the carriers to anything anymore, or their previous offspring either, unless they have been tested clean by test breeding, which is often inbreeding.

Outcrossing is the only way to bring in a good trait that is missing from your line, provided that you outcross to an animal that has it. Any old outcross won't do. An outcross with the same problem will pass on the problem.

Line breeding is a somewhat distant inbreeding. There are disagreements as to how distant. The more distant the relationship, the fewer traits the individuals will have in common.

Inbreeding is the only way to develop a line that is pretty much uniform. We hope we can keep all the good traits and get rid of the bad ones. Any old inbreeding won't do it, either. A brother and sister can be as genetically different as any outcross strangers. Inbreeding for known undesirable traits is just plain dumb. But sometimes whatever kind of breeding we do, we lose a good trait we really want. The only thing to do then is to breed to something that has got it. In an outcross, we may also introduce a lot of bad recessives we didn't have before, but if we then inbreed to an animal that has the traits we want on top of the good traits we already have, we can add the new trait to our line.

So you see, each type of breeding has its advantages and risks. Inbreeding can double up a lot of good traits and stabilize a strain, but it can also double up on bad ones and make them very hard to breed out. Outcrossing can bring in good traits we need, but it can also bring in a lot of bad traits we can have a hard time getting rid of.

One more thing we have to do to maintain the integrity of a line is to weed out the undesirable individuals. This is called culling, and it can be done in several ways. One way is to euthanize defectives, and this is best if the animal's health is doomed. Otherwise, we can spay or castrate defectives or just never breed them.

In the case of an endangered species or rare breed, it is sometimes necessary to breed genetically defective animals in order to carry on because there are so few individuals available. In such a case, it is especially important to know the genetic makeup of the animals remaining. This is possible only by keeping accurate records of the results of each breeding. When we know what recessives the individuals are carrying, we can be careful not to breed animals carrying the same undesirable traits to each other, and be able to breed animals not carrying those traits as well. Eventually, by eliminating one or two undesirable traits at a time, we can build up a population of sound animals not carrying undesirable traits.

One more important point should be made on the breeding of wild animals in captivity. The emphasis here is different than in the breeding of domestic stock. Domestic species and breeds are highly specialized for certain purposes. The gene pool is narrowed down until we have only the genes we want, usually including some options. In maintaining wild species, however, it is best to keep the full spectrum of the original gene pool. This is impossible in any one animal, of course, since only two genes are carried on each site, which is called the locus. But variety can be maintained in the overall population. It is still a very good idea to weed out the lethals, and also to keep isolated populations genetically pure. For instance, keeping the different giraffe color patterns distinct by not interbreeding them is desirable unless one of the subgroups is threatened with extinction and there are not enough individuals left to continue it without hybridizing with another group and then sorting out the characteristic genes in later generations.

GRASS ROOT GENETICS -- ANIMAL BREEDING, Continued

(Editor's Note: Part 1 of this series can be found in the October 1982 issue of AKF; Part 2 "Genetic Complications" can be found in the November 1982 issue of AKF. Part 4 "Pedigrees" will appear in an upcoming issue.)

Bibliography for this series:

Muntzing, Arne: Genetic Research. Stockholm, Sweden; Neijels Bokindustri, Halmstad, 1961.

Jude, A.C.: Cat Genetics. Fond du Lac, Wisconsin; All-Pet Books, Inc. 1955.

Kidd, Randy: "The Amazing Irish Dexters," The Mother Earth News, 62:71, March-April, 1980.

Dalzell, Bonnie: "Practical Genetics," The Irish Wolfhound Quarterly, Vol. 4, No. 3, : 19-21, Winter 1981-82.



WINTER ZOO KEEPING (Not Just A Job, An Experience)

By
Gary Lillo, Zoo Keeper
Topeka Zoological Park, Topeka, KS

Well, it's winter again and man I'm freezing,
All the animals and keepers, running around sneezing.
Everyone dressed, looking like they've gained 100 lbs,
Dreading 0800 when we have to start our rounds.
All my tools are buried and the locks all froze,
Now I need something to stop my running nose.
I work for awhile, and hope for a break,
But then it starts raining, it's all I can take.
So, I work a bit faster and try to keep warm,
But I'm in Kansas, where 45mph breezes are the norm.
It again starts blowing and cuts me like a knife,
I think to myself, should I take my own life?
But I check the time and see it's near noon,
And I can hang on knowing, I'll be warm again soon.
Now lunch is over, and I have to get back,
Asking myself, would it be easier to just take the rack?
So, I walk out again through the rain, mud and snow,
I know it's getting colder, I just lost another toe.
I clean my barn, then off to the dump,
Feeling a bit better, now I'm over the hump.
I crawl back to the keeper center, for it's almost 5,
I make it to my locker and thank God I'm alive.
Then 5:00 rings and I'm glad, but sad, too,
For I know tomorrow what I'll have to go through.
I go home and lounge in a deep hot tub,
I start to relax and eat a little grub.
Then it hits me like a flash, I know what I must do!
Start working on my resume, for Miami's Metro Zoo.

Legislative News

Compiled by Kevin Conway

CITES AMENDMENTS PROPOSED BY USFWS

Following a review of the status of wildlife and plant species that are native to the U.S. listed on Appendices I and II of CITES, the U.S. Fish and Wildlife Service has announced its proposed changes to these Appendices. They will be submitted for consideration by the CITES nations at the next regular meeting in Botswana in April 1983.

The Service's review was conducted in coordination with the Canadian Wildlife Service and the Direccion General de la Fauna Silvestre of Mexico. In developing proposals, the Service considered comments and information received in response to earlier notices in the *Federal Register*, and the views of the Central Committee, a group representing various CITES parties organized to appraise and coordinate such reviews.

Candidate Species -- a summary of the proposals: (Fauna listings only)

\$Gray wolf (Canis lupus)--The Service proposes to remove Alaskan and Canadian populations of this species from Appendix II. It does not anticipate that this action will create trade problems concerning wolf pelts from other populations since both Alaskan and Canadian Provincial game departments have established tagging and documentation systems.

\$Bighorn sheep (Ovis canadensis)--The Service proposes to delist (remove from Appendix II) the U.S. and Canadian populations, which are now listed only because of similarity of appearance to the Mexican population. The Service anticipates no trade problems given the strict control of sport hunting in all three countries.

\$Grizzly and brown bears (Ursus arctos)--The Service proposes to remove North American populations from Appendix II on the grounds that they are listed only for reasons of similarity of appearance, they are protected by State and Federal law in the U.S. and the Mexican population appears to be extirpated.

\$Canadian lynx (Lynx canadensis)--The Service proposes to remove the species from Appendix II. The species is under State and Provincial management that should prevent its becoming threatened with extinction by international trade.

\$River otter (Lutra canadensis)--The Service proposes to list this species in Appendix II for reasons of similarity of appearance only. It is now listed because of potential threat to its survival from international trade as well. Biological data are sufficient to show that the species is not potentially threatened with extinction by international trade.

\$Tule white-fronted goose (Anser albifrons gambelli)--The Service proposes to remove this subspecies from Appendix II because it is not really distinguishable from the more common white-fronted goose, (A. albifrons frontalis), and because it is given as much protection from overexploitation from trade as possible under existing Migratory Bird Treaties.

\$Mona island boa and Virgin Islands boa (Epicrates monensis)--The Service proposes to transfer these snakes from Appendix II to Appendix I on the grounds that both subspecies (E. monensis monensis on Mona island and E. monensis grant on the Virgin Islands) are threatened with extinction and they are similar in appearance to the Puerto Rican boa (E. inornatus) which is listed in Appendix I.

\$Blue pike (Stizostedion vitreum glaucum)--The Service proposes to remove this subspecies from Appendix I because no specimens have been found since 1965 despite extensive sampling of fish stocks. The Service has proposed to delist the fish.

LEGISLATIVE NEWS, Continued

Longjaw cisco (*Coregonus alpenae*)--The Service proposes to remove this species from Appendix I because it is likely extinct. The fish was also proposed to be delisted under the Act.

---Endangered Species Technical Bulletin
Vol. VII, No. 12, December 1982

NOTICE LISTS CANDIDATE VERTEBRATE SPECIES

The USFWS identified in a recent notice of review 363 U.S. vertebrates that are being considered for addition to the U.S List of Endangered and Threatened Wildlife and Plants. The largest number of candidates species are fish (136), followed by birds (71), mammals (64), reptiles (47), and amphibians (45).

The animals included in the new notice are grouped in several categories in order to accurately reflect the Service's present evaluation of their conservation status. Category 1 included 62 animals for which the Service already has substantial information to support the biological appropriateness of proposing to list the species as Endangered or Threatened, and for which the preparation and publication of such proposals are anticipated. Category 2 includes 301 species for which further information is needed to determine whether they qualify for listing. Category 3 comprises 38 species that are no longer being considered for listing as Endangered or Threatened. Among the vertebrates in Category 3 are 14 species that are presumed to be extinct; 5 that are not regarded as taxonomically valid species or subspecies; and 18 that are more widespread than formerly believed or that are not presently subject to any identifiable threat.

The notice requests information concerning status, taxonomy, and distribution of the identified species; recommendations concerning possible designation of Critical Habitat; documentation of threats to any of the species; and nominations of taxa not included in the list. The list of candidates species will be amended periodically to reflect new information or change in the status of the species. A copy of the notice may be obtained from the December 30, 1982 *Federal Register* document or by writing the Director (OES), U.S. Fish and Wildlife Service, Dept. of the Interior, Washington, D.C. 20240. Comments or information on the species included in the notice may be sent to the above address. The Service anticipates publication of a similar notice on invertebrate species in the near future. Such a notice on U.S. plants was already published in the *Federal Register* on 15 December 1980.

---Endangered Species Technical Bulletin
Vol. VII, No. 1, January 1983

PROPOSED LISTING OF 17 SPECIES OF FOREIGN REPTILES AS ENDANGERED/THREATENED

The USFWS proposes that 17 species of foreign reptiles be listed as Endangered or Threatened species as provided for by the Endangered Species Act of 1973, as amended. The threats that are believed to be causing the decline of these species are habitat destruction, the introduction of non-native predators, exploitation as a source of human food mainly by local people, vandalism, and overcollection. If made final, this rule would provide additional protection to wild populations of these species and allow cooperative research programs to be undertaken on their behalf.

LEGISLATIVE NEWS, Continued

Comments from the public and from the governments of the countries where these species occur must be received by 21 March 1983. Submit comments to Director, Office of Endangered Species, Y.S. Fish and Wildlife Service, Dept. of the Interior, Washington, D.C. 20240.

Common Name	Scientific Name	Proposed Status
Serpent island gecko	<i>Cyrtodactylus serpensinsula</i>	T
Acklins ground iguana	<i>Cyclura rileyi nuchalis</i>	T
Allen's Cay iguana	<i>Cyclura cythlura inomata</i>	T
Andros island ground iguana	<i>Cyclura cythlura cythlura</i>	T
Cayman Brac ground iguana	<i>Cyclura nubila caymanensis</i>	T
Cuban ground iguana	<i>Cyclura nubila nubila</i>	T
Exuma island iguana	<i>Cyclura cythlura figginsi</i>	T
Grand Cayman ground iguana	<i>Cyclura nubila lewisi</i>	E
Jamaican iguana	<i>Cyclura collei</i>	E
Mayaguana iguana	<i>Cyclura carinata bartschi</i>	T
Turks and Calcos iguana	<i>Cyclura carinata carinata</i>	E
Waiting island ground iguana	<i>Cyclura rileyi rileyi</i>	T
White Cay ground iguana	<i>Cyclura rileyi cristata</i>	T
Round island skink	<i>Leiolopisma telfairii</i>	E
Central American river turtle	<i>Dermatemys mawii</i>	T
Aruba island rattlesnake	<i>Crotalus unicolor</i>	E
Lar Valley viper	<i>Vipera latifii</i>	

---Federal Register
Vol. 48, No. 14
January 20, 1983

CONDOR UPDATE--RESEARCH AND CAPTIVE PROPAGATION EFFORT WIDENED

The cooperative effort between the Service and the National Audubon Society to prevent the extinction of the California condor (*Gymnogyps californianus*) has been widened by recent decisions of the California Game and Fish Commission that allow for an intensified research and captive propagation program. Recent surveys that use photographic identification of individual birds indicate that only about 20 birds remain, a number significantly lower than the estimate of 30 in recent years through older census techniques.

On 7 January, 1983, the Commission made the following rulings: 1) Permission was given to radio-tag an additional two condors of any age, although adults can only be captured until 31 January, 1983, the start of the breeding season. 2) First eggs can be taken from any nest for artificial incubation and eventual captive breeding since it has been proven that California condors can lay a second egg if the first is lost. 3) An underweight, immature male condor that was taken to the Los Angeles Zoo on 5 December, 1982, to gain weight will be retained in captivity for breeding purposes. 4) Alternate capture techniques may be used to trap an unpaired adult condor that is believed to be a female. The bird will be used in the captive breeding program. Cannon-netting, the method used thus far in the California condor program, is not appropriate in the location this individual inhabits, and alternatives that have proven effective to capture Andean condors (*Vultur gryphus*) may be used.

LEGISLATIVE NEWS, Continued

The permit issued to the Service in 1982 allowed up to two birds to be radio-tagged. The first condor was captured in October, and the second was trapped November 13 with its mate. The two birds approached the bait so closely that one could not be captured without taking the other. No problems were encountered in trapping or handling the birds. The bird that blood sample analysis later revealed as male was fitted with identification tags and two small, solar-powered transmitters. One of the radios contains a 7-year pacemaker battery that switches on automatically at night or whenever sunlight cannot reach the transmitter's solar cell, insuring a continuous signal for the trackers. This radio allows the researchers to chart the bird's movements, and to locate the condor if it dies in such a way that solar radiation cannot reach the transmitters. Since the condor mortality rate appears to be even greater than originally thought, perhaps as many as four or five being lost each year, radio tracking could help the research team determine the causes and work toward a reversal of the downward trend.

The research team has resumed its efforts to trap a female condor for captive propagation with Topa-Topa, the male, at the Los Angeles Zoo. Meanwhile, the male condor chick removed from the wild in August 1982 after parental neglect continues to do well at San Diego Wild Animal Park.



COOKBOOK SALES TO BENEFIT REHABILITATION PROGRAM

Submitted by Judie Steenberg

INCREDIBLE EDIBLES...is a collection of recipes from the Keepers and Staff of the Audubon Park Zoological Gardens. All proceeds from the cookbook go to the Wild Bird Rehabilitation Program at the Audubon Park Zoo. A page explaining the program states, "Your support will help return a heron, hawk or owl to freedom".

Sections include recipes on breads, dips, appetizers, soups, salads, sauces, Louisiana dishes, main dishes and desserts. Additional pages in the back give information on substitutes and weights/measures. There are 131 pages in all with several extra blank pages for adding your own recipes.

Leaping Lemon Lemur Bread, Flamingo Fun Fondue, Roast Gnu Potatoes, 50#s of Crayfish, Toad-in-the Hole, Birdhouse Chicken and Zoo Keeper Chicken, Mouse ala Orang-utan, Lihakartulipott (Finnish Potato Pot), Zabaliogne, Chocolate Capybara Cake and Hippopotamus' Misery are for real recipes in the book.

Verse and illustration are interspersed among the recipes throughout the book. The Louisiana recipe section includes Crabmeat Au Gratin, Sunny Shrimp & Baked Oysters with bread crumbs and Garlic. Tuna Cashew, Pork Chops in Beer and Beef Bourguignon to Beef Wellington are in the Main Dish Section. There are even three Quiche recipes for "Real Men".

The unique cookbook costs \$10.00 and can be acquired by contacting Frank Kohn or Dee Nelson, Audubon Park & Zoological Garden, New Orleans, LA 70118. Checks should be made payable to "Wild Bird Rehabilitation Center".



Information Please

REQUEST FOR INFORMATION: A study of the problems associated with chronic undernutrition in wild-caught primates, especially folivores, is being conducted in association with the San Diego Zoo.

In the past our zoo has received recently wild-caught primates showing many signs of long-term undernutrition as has been seen in humans suffering from regional famine or the conditions of concentration camps. The syndrome is characterized by a relatively low body weight, slow pulse, lowered blood pressure, bloodshot eyes, insomnia, osteoporotic fractures, starvation edema (large belly, swollen face), sore mouth with increased salivation and dry, coarse, cold skin. Of particular concern is the problem of getting these animals onto a proper diet. Having physiologically adapted over a period of several months to a nutrient poor diet, the sudden consumption of a nutrient rich diet can cause severe reactions, including diarrhea, bloat, indigestion, nutrient malabsorption or other problems that may result in death. In humans it has been determined that therapy for this syndrome involves the gradual increase in complexity and quantity of food offered, often starting with partial or total intravenous feeding.

In hindsight, we have most often seen this syndrome in wild-caught folivorous primates where the collector had been feeding the animals a diet based on cereal grain, for example. That is, a diet rich in carbohydrates, but otherwise nutrient poor.

This study will be largely based upon past San Diego Zoo necropsy and medical records as well as the literature on starvation in human medicine. If anyone has had similar experiences with chronically undernourished animals, especially successes or failures in adapting them to a captive diet, we would greatly appreciate your input. Please address correspondence to: Jeff Turnage, San Diego Zoo Hospital, P.O. Box 551, San Diego, CA 92112.

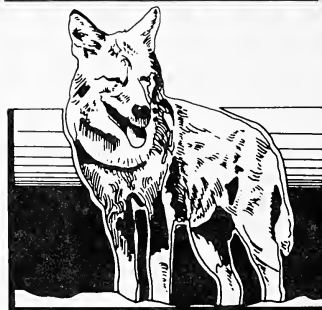
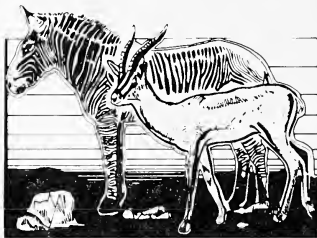
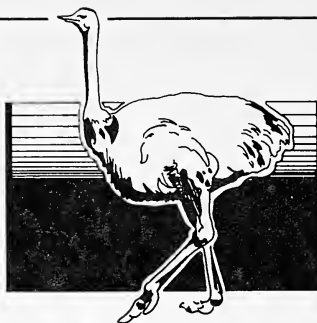
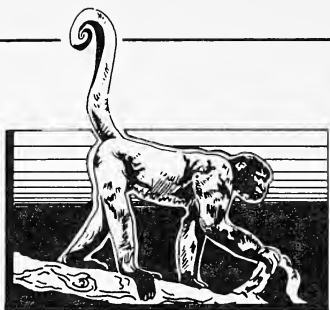
Any information regarding any ill-effects of the use of Paramune-6 vaccine, serial number 79 1192 1010, expiration date 31 October 1982, by Dellen Laboratories, Inc., or any other distemper/parvovirus vaccines would be appreciated. Also any information on vaccinating carnivores, Fennex Fox (*Fennecus zerda*) in particular, against distemper/parvovirus, including age of animal when vaccinated, type of vaccine used, dosage, any side effects, etc. Please send the information to: Renee Kilcoyne Sowards, Animal Care Center, Phoenix Zoo, P.O. Box 5155, Phoenix, AZ 85010.

RESEARCH ASSISTANCE NEEDED: Request for mites and ticks from reptiles! Preserve in isopropyl alcohol if 70% ethyl alcohol is not available. Please send ectoparasites to: Sue Barnard, Senior Reptile Keeper, Atlanta Zoological Park, 800 Cherokee Ave., SE, Atlanta, GA 30315.

Information is needed on the breeding behavior, sexual differences and soft part color changes of the Marabou Stork (*Leptoptilos crumeniferus*). Any information on pair formation and pre-breeding behavior would be especially helpful. Please contact the Bird Dept., Knoxville Zoological Park, Box 6040, Knoxville, TN 37914.

INFORMATION NEEDED: Our zoo is requesting information on any documented cases of parvo virus in primates. We have strong evidence that parvo virus was the cause of death of one of our collection's colobus monkeys. Please send information to: Dr. Jack Bostwick, Consulting Zoo Veterinarian, Sunset Zoological Park, City Hall/11th & Poyntz Ave., Manhattan, KS 66502.





for your
captive
audience

Spectrum offers
a complete line of
High Quality
Food Products,
and we're proud of
the Professional Service
we give our Customers.

Zu/Preem.

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

EXCLUSIVELY DISTRIBUTED BY



Animal **SPECTRUM** Inc.
5801 Locust Street
Lincoln, Nebraska 68516

Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-6492

Research.....

ECHIDNA STUDY AT THE TOPEKA ZOO

By

Connie Cloak, Animal Keeper
Topeka Zoological Park, Topeka, KS

and

John Brannian, Animal Technician
Kansas City Zoo, Kansas City, MO

During the year from October 1981 through September 1982, we conducted a general study of behavior and activity patterns in a pair of short-nosed echidnas (*Tachyglossus aculeatus*). We were also examining information in the literature on this species applicable to captive management, and evaluating the diet on which our animals were maintained. We received an AAZK Research Grant to cover the expenses incurred in our study.

While the echidna is quite common throughout its wide range in Australia, relatively little is known about its natural behavior, particularly reproductive behavior. As it is a monotreme, or egg-laying mammal, its reproduction is of especial interest. As far as we have been able to learn, echidnas have reproduced in captivity only a few times, and no young have survived to maturity.

Our echidnas are housed within a concrete-walled enclosure approximately 3x5 meters with a natural soil substrate deep enough for them to burrow completely under the surface. This enclosure is in a tropical habitat building containing free-ranging birds, reptiles, and small mammals. The enclosure contains many live plants and a hollow log around which the animals spend most of their time.

Both of our echidnas came to the zoo as adults several years ago, and not much is known of their previous history. Our male is a large animal whose weight remains in the range of 6.5 kg to 7.0 kg. Our female is smaller, with a maximum recorded weight of 3.5 kg during the study period, and a minimum of 2.7 kg. This minimum for the female was recorded during the late winter months and represents a greater than 25% loss from the maximum.

This fluctuation in weight, plus the observation that the female was entering extended periods of inactivity, led us to question the adequacy of our diet. Both animals had constant diarrhea, whereas normal stools in the wild are dry scats consisting mainly of the exoskeletons of the termites and ants on which they feed.

Our diet consisted of dog chow, canned cat food, hard-boiled egg, dry milk, and orange blended with water into a gruel. Commercial analysis of this diet revealed a marked dissimilarity to the natural diet in nutritional composition. In particular, the fat content was much lower, and information in the literature on carbohydrase activity in echidnas suggested that most of the carbohydrate in the diet was probably unavailable to them.

With the help of Dr. George Doering and his colleagues at Mark Morris Associates in Topeka, a new diet was designed. This consists of a canned dog food diet of finely ground meat in gravy, called "Mixit", supplemented with corn oil and vitamin C. This diet is significantly higher in fat and protein, and contains maltose, whereas the former diet contained lactose, which is undigestible by echidnas.

ECHIDNA STUDY AT THE TOPEKA ZOO, Continued

Both animals ate the new diet voraciously when it was introduced. The male's weight has remained steady or gained slightly. The change in the female's weight has been dramatic: while during the winter of our study period, her weight was dropping steadily, at this time she continues to gain weight and is presently at 3.9 kg, well above her previous maximum. The diarrhea has abated very little, so that it seems likely to be due more to the moisture content of the diet than to the lactose as we had supposed. We are looking into further diet modifications to slow the rate of passage and alleviate the diarrhea.

During the study period, we undertook once monthly 24-hour observation periods to give us an indication of their daily activity patterns. These observations were correlated with ambient temperature and photoperiod (which is natural in this exhibit, and at our latitude is appropriate for echidnas). We have found that during the warmer months, daily activity periods lengthen, with earlier onsets. They remain primarily nocturnal throughout the year. Ambient temperatures usually remain within the 17c tp 30c range.

No definite sexual behavior was observed during the year of our study. In the past, the male had been observed following the female around persistently and attempting to mount, and once after a long period of this activity he rolled onto his back and ejaculated. No pouch development was seen in the female during the entire study period. Pouches, in which the single egg is incubated, form in females during the breeding season. Our observations on behavior and activity patterns and our nutritional data are being prepared in more detail for publication elsewhere. We would be very pleased to correspond and share information with others who have echidnas.

We wish to acknowledge the following: The AAZK Research Committee, for the grant which made our study possible; the Topeka Zoo staff for allowing us to proceed and offering help and encouragement along the way; and Dr. George Doering, DVM, and his colleagues at Mark Morris Associates for their generous help in evaluating and redesigning the diet.

Products mentioned in the text:

"Mixit" made by Hill's, Division of Riviana Foods, Topeka, KS.

Bibliography on Echidnas

The following bibliography is taken from a computer search for literature. We have selected references which might be of interest to those maintaining captive echidnas, and have grouped them in categories. The entire list is available to anyone interested.

General References

- Augee, M.L., 1974. Monotremes. Aust Mammal 1: 89-94
Griffiths, M., 1968. Echidnas. Pergamon Press, Oxford.
Griffiths, M., 1972. The life of the echidna. Aust Nat Hist 17: 222-226
Griffiths, M., 1978. The Biology of the Monotremes. Acad. Press, New York
Grzimek, B., 1972. Grzimek's Animal Life Encyclopedia. Vol. 10
Van Nostrand Reinhold Co., New York.

Behavior and Ecology

- Augee, M.L., Ealey, E.R.M., Price, I.P., 1974. Home range of Tachyglossus aculeatus on Kangaroo Island. Aust Mammal 1:301.
Augee, M.L., Ealey, E.H.M., Price, I.P., 1975. Movements of echidnas, Tachyglossus aculeatus, determined by marking, recapture and radio tracking. Aust Wildl Res. 2:93-101.

ECHIDNA STUDY AT THE TOPEKA ZOO, Continued

- Augee, M.L., Bergin, T.J., Morris, C., 1978. Observations on behavior of echidnas at Taronga Zoo, Australia. Aust Zool 20: 121-130.
- Brattstrom, B.H., 1973. Social and maintenance behavior of the echidna, Tachyglossus aculeatus. J Mammal 54: 50-70.
- Brattstrom, B.H., 1978. Social behavior of the echidna, Tachyglossus aculeatus: an energetic and evolutionary perspective. Aust Zool 20: 255-256.
- Buchman, O.L.K., Rhodes, J., 1979. Instrumental learning in the echidna, Tachyglossus aculeatus setosus. Aust Zool 20: 131-146.
- Buchman, O.L.K., Rhodes, J., 1979. Instrumental discrimination reversal learning in the Monotreme Tachyglossus aculeatus setosus. Anim Behav 27: 1048-1053.
- Denny, M. J.S., 1975. Mammals of Sturt National Park. Aust Zool 18: 179-195.
- Saunders, J.C., Chen, S.C., Pridmore, P.A., 1971. Successive habit reversal learning in Monotreme Tachyglossus aculeatus. Anim Behav 19: 552-555.
- Saunders, J.C., Teague, J., Slonim, D., Pridmore, P.A., 1971. A position habit in the Monotreme Tachyglossus aculeatus. Aust J Psychol 23: 47-51.
- Van Deusen, H.M., George, G.G., 1969. Results of the Archbold Expeditions No. 90. Notes on the echidnas. Amer Mus Novitates 1-23.
- Whinray, J.S., 1971. The present distribution of some mammals in the Furneaux Group, Bass Strait, Tasmania. Vict Nat 88: 279-286.

Reproductive Biology

- Bick, Y.A.E.; Murtagh, C.; Sharman, G.B., 1973. The Chromosomes of an egg-laying mammal, Tachyglossus aculeatus. Cytobios 7: 233-243.
- Carrick, F.N.; Hughes, R.L., 1978. Reproduction in male monotremes. Aust Zool 20: 211-232.
- Griffiths, M.; McIntosh, D.L.; Coles, R.E.A., 1969. The mammary gland of the echidna Tachyglossus aculeatus with observations on the incubation of the eggs and on the newly hatched young. J Zool (London) 158: 371-386.
- Hughes, R.L.; Carrick, F.N., 1978. Reproduction in female monotremes. Aust Zool 20: 233-254.

Anatomy and Physiology

- Augee, M.L.; Ealey, E.H.M., 1968. Torpor in the echidna Tachyglossus aculeatus. J Mammology 49: 446-454.
- Augee, M.L.; Ealey, E.H.M.; Spencer, H., 1970. Bio-telemetric studies of temperature regulation and torpor in the echidna. J Mammology 51: 561-570.
- Dawson, T.J.; Grant, T.R.; Fanning, D., 1979. Standard metabolism of monotremes and the evolution of homeothermy. Aust J Zool 27: 511-516.
- Gates, G.R., 1978. Vision in the monotreme, echidna Tachyglossus aculeatus. Aust Zool 20: 147-170.
- Griffiths, M.; Elliot, M.A.; Leckie, R.M.C.; Schoeffl, G.I., 1973. Observations of the comparative anatomy and ultrastructure of mammary glands and on the fatty acids of the triglycerides in platypus and echidna milk fats. J Zool 169: 255-279.
- Messer, M.; Kerry, K.R., 1973. Milk carbohydrates of the echidna and the platypus. Science 180: 201-203.
- Murray, P.F., 1981. Unique jaw mechanism in the echidna Tachyglossus aculeatus. Aust J. Zool 29: 1-6.



Death and Birth in the Rain - A Eulogy

By

Terry Weber, Primate Keeper
Jackson Zoological Park, Jackson, MS

The winds changed this winter
to warm balmy nights
and sticky days in December.
Life slipped on over
to the far side of crazy
and I felt it--
oh, how I felt it.
Spring flowers when it
should be freezing
budding trees
fooled into believing--
even the flamingoes
trodding the nest area
of their pond...

No one knows
no one can tell
the difference between
this madness
and the madness
of the regular one...

In my world...
life is different
than in yours...

Today in the rain
life was given
and life was taken...

They are elegant
in their length
and in
their innocence--
18 feet tall! Some of them--
but not her,
no, not her...

I remember her
not-so-grand entrance
expectedly unusual in '79.
Two hours we waited
to see her born,
tumbling,
300 pounds of her to
the padded stall floor
where we rubbed her dry
with white and bloody towels...

Today the pygmy mother
was nervous
unsure and suspicious--
all of a sudden
strangers...visiting the hippo barn
and something small and new
searching for
his mother's smell.
We left her
for him to discover.

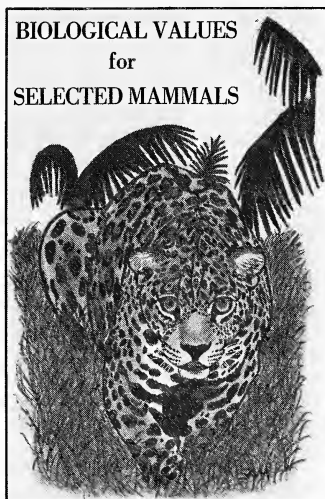
Today she was the right
height and
today she was
too curious
and too spooky.
Small brains and
little nerve
serve
for failure of a species
or of a man
or of any of us, but
she didn't know that--
she got herself hung
on a metal bar
designed to hold a
ramp for walking men
to bring her feed...

Tonight in the rain
all eleven members
pushed and pulled
on a dead giraffe
4 years old
buried in two hours
behind the zoo.
We left her there
uncovered
in a water-filled grave.
In the falling night
the backhoe stuck
and
some of us cried.



Announcing...

New AAZK Publication Available



AAZK is pleased to be able to offer its members and other interested individuals in the zoo community the newly published mammal reference booklet entitled BIOLOGICAL VALUES FOR SELECTED MAMMALS. This 55-page work contains biological data on 200 species of mammals. Included in the data are: common name, scientific name, range, gestation, weaning, lifespan, sexual maturity, litter size, estrus cycle, body temperature, and names used for the male, female and young of each species. References for data given are also included.

This informative publication was researched and compiled by a team of zookeepers, docents, interns and zoo volunteers at the San Francisco Zoo. Formatted for quick and easy reference, and charmingly illustrated, this booklet will surely be an important addition to any zoo keeper's library. AAZK has arranged for 50% of the profits, after initial costs are met, to be assigned to the San Francisco Zoological Society, a non-profit support organization of the San Francisco Zoo.

BIOLOGICAL VALUES FOR SELECTED MAMMALS is being offered to AAZK Professional members for only \$1.25. Other membership categories and non-members may purchase the booklet for \$2.50. Prices include postage and handling. To order, fill out the form below or send necessary information to: Biological Values Book, c/o AKF Editorial Offices, 635 Gage Blvd., Topeka, KS 66606. Make check or money order payable to: "Biological Values/AKF".

BIOLOGICAL VALUES ORDER FORM

Please send _____ copies at \$ _____ each to:

Name _____

Address _____ City _____

State _____ Zip _____

Please check membership category: P() AF() AS() INST() NON-MEM()

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ANIMAL KEEPER...requires experience in husbandry skills with large mammals, especially elephants. Mail resume/references to Andy Grobins, Metropolitan Park District, 10 Idaho Street, Tacoma, WA 98409.

PACHYDERM KEEPER...to participate in husbandry program of Asian/African elephants, rhinoceros, hippopotamus and assist with public demonstrations. Experience required. Salary \$7.02-\$7.35/hourly, plus benefits. Submit resumes to Mrs. Thomas, Personnel Supv., Oklahoma City Zoo, 2101 N.E. 50th, Oklahoma City, OK 73111.

(Two Positions) CURATOR AND HEAD KEEPER...curatorial position requires degree and experience in zoological park operations. Head Keeper position requires zoo experience. For either position, send resume to Pat Quinn, Benson's Animal Park, Rt. 111, Hudson, NH 03051.

SENIOR ZOO CURATOR...requires MA in Zoology or related field, 2 years' supervisory experience, or BS and 3 years' experience. Must have background in herpetology and aquarium experience. Salary - \$20,000. Contact Linda Robledo, Audubon Park & Zoological Garden, P.O. Box 4327, New Orleans, LA 70178 (504) 861-2537.

The following job listings were sent directly to the editorial offices of Animal Keepers' Forum for inclusion in this section.

ELEPHANT HANDLER...experienced handler to assist trainer. Includes participation in African elephant husbandry program and exotic hoofstock management. Salary \$924-\$1,224/month, plus benefits--commensurate with experience. Send resume directly to Mike Blakely, Curator/Mammals, Kansas City Zoo, Swope Park, Kansas City, MO 64132.

ZOOKEEPER...position available 13 February 1983. Responsible for care of variety of birds and some small mammals. Wide range of experience with birds desirable, including record keeping, breeding, dietary requirements, and general husbandry. Salary range from \$12,765 to \$15,434. Applications and information available from City of Springfield (Dickerson Park Zoo), Department of Personnel, 830 Boonville Ave., Springfield, MO 65802 (417) 864-1600.

ASSISTANT CURATOR/BIRDS AND MAMMALS...will provide overall supervision of one Head Keeper and six (6) Keepers, and will assist the Curator in directing programs for docents, volunteers, aides and interns assigned to the department. Applicants must be ecologically oriented and must have basic knowledge of birds and mammals, their maintenance and dietary requirements. Experience in raising baby animals mandatory. A minimum of two (2) years of progressively responsible experience in an accredited zoo is required. A bachelor's degree in Zoology, Wildlife Management or a related field is required. Salary range is \$15,950 to \$21,450 per annum. Full benefit program. Send resume and salary requirements in confidence to Personnel Director, Arizona-Sonora Desert Museum, Route 9, Box 900, Tucson, AZ 85743. Closing date for receipt of resume is 1 April, 1983. EOE.

o
p
p
k
o
r
t
u
n
i
t
y

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo	Work Area	Special Interests
-----	-----------	-------------------

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka

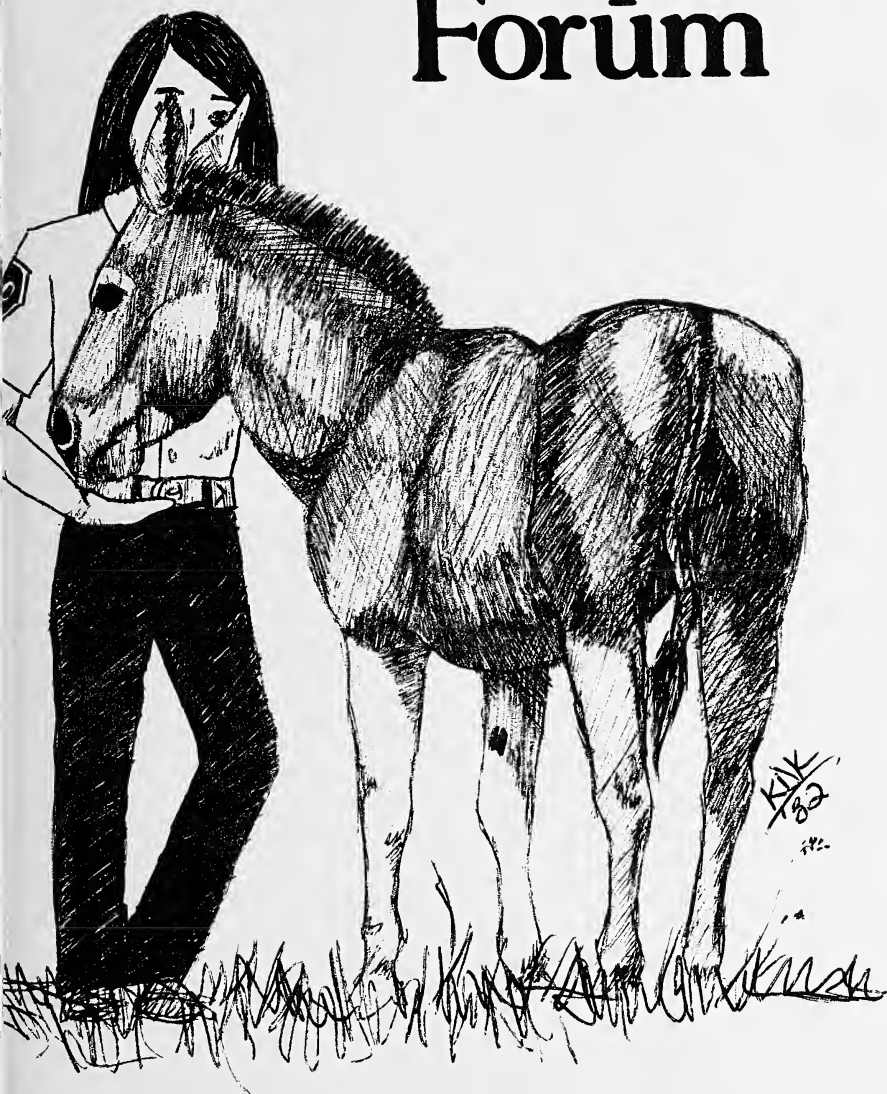


NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

Smithsonian Institution Libraries

Animal Keepers' Forum



Dedicated to Professional Animal Care

APRIL 1983

Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
 Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
 Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
 Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
 Steve Taylor, Louisville Zoo, Louisville, KY 40213
 Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Audubon Park Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
<u>Bernie Feldman, Miller Park</u>	<u>Mike Coker, Topeka Zoo</u>
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, *Director*

Ed Roberts	Walter D. Stone Zoo	ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D.C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Laurence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's artist is Kelli Kimble, a seasonal, part-time employee in the Children's Petting Zoo at Topeka, KS. Her sketch shows a keeper with an Onager. Thanks, Kelli!

Scoops and Scuttlebutt

VICE PRESIDENT RESIGNS; REPLACEMENT NAMED TO BOARD

National Vice President Jill Grade has resigned from her board position recommitting her time and energy to the pursuit of further education. Jill has been active in AAZK affairs for many years and has been an energetic board member and appreciated Vice President. We all owe Jill thanks, wish her luck in school, and know that she will remain as active as possible.

Jill's vacant board position has been filled by Connie Cloak, a keeper at the Topeka Zoo and former Associate Editor of Animal Keepers' Forum. She will serve the remainder of Jill's unexpired term through Dec. 31, 1983. Congratulations to Connie on her appointment.

NATIONAL ELECTIONS COMMITTEE CHAIRMAN NAMED

Lynne Villers, Indianapolis Zoo, has been appointed as Chairman of the AAZK National Elections Committee. Lynne, along with two other appointed committee members will coordinate the national AAZK elections which will be held in July of this year. Three board seats are up for re-election--those held by Mike Maybry, Steve Taylor and Connie Cloak. Information on the nomination procedure can be found on page 77 of the March 1983 issue of the Forum. The committee will verify the eligibility of all nominees and ballots and a short biographical sketch of the candidates will be mailed to all Professional members the first week in July. Deadline for nominations is April 30, 1983.

PRIMATOLOGISTS MEETING PLANS ROUNDTABLE DISCUSSION

During the meeting of the American Society of Primatologists in East Lansing, MI, August 7-10, 1983, there will be a roundtable discussion on the benefits of mutual understanding between zookeepers and researchers. As keepers, we have data, informal observations and lots of questions for researchers, and can offer assistance interpreting what is seen. Researchers have the time and training to formalize the projects that keepers conceptualize. We need to establish lines of communication. Please watch the ASP BULLETIN for details on registration for the meeting.

1982 TORONTO AAZK T-SHIRTS STILL AVAILABLE/CONFERENCE PHOTOS SOUGHT

The 1982 AAZK Conference Committee from Toronto Canada has advised AKF that there are a limited number of Conference T-shirts still available, in beige only, sizes 38 and 40. The cost is \$7.00, including postage. They may be ordered from Metro Toronto Zoo AAZK Chapter, P.O. Box 280, West Hill, Ontario, Canada M4W 1B7.

Also, the Toronto Chapter would like to put together an album of photographs taken during the Conference, and if members have any they would like to share, they are asked to send them to the address printed above.



Births & Hatchings

METRO TORONTO ZOO.....*Oliver Claffey*

January 1983 B&H from Metro Toronto Zoo, Canada include: 0.0.? Sugar glider, 0.0.1 Bennett's wallaby; 0.0.1 Egyptian fruit bat, 0.0.1 Ring-tailed lemur, 0.0.4 Common marmoset, 0.2 Grizzly bear, 1.0 Reeve's muntjac, 0.0.2 Black-footed penguin, 0.1 Zebra dove, 0.2.5 Ring-necked dove and 2.1.3 Peach-faced lovebird.

BRONX ZOO.....*Margaret Price*

February 1983 zoo animal births at the Bronx Zoo, NY include: Birds - 1 Malay peacock pheasant; Mammals - 0.1 Gaur, 4.3 Wild cavy, 2.0 Egyptian fruit bat, 2.0 Maxwell duiker, 2.2 Nyala, 1.0 Hammer headed bat, 1.0 Mouflon, 2.0 Patagonian cavy, 1.0 Sambar, 1.0 Pen-tailed bettong, and 1.0 Duiker.

MEMPHIS ZOO AND AQUARIUM.....*Robert Evans*

Births and Hatchings for the months of January and February 1983 at the Memphis Zoo and Aquarium include: 0.1 Nilgiri tahr, 1.0 Gaur, 0.1 Giraffe, 1.0 Kudu, 0.1 Red lechwe, 0.0.2 Golden lion marmoset, 1.0 Ankoli, 0.0.1 Nile hippo, 2.1.4 Pygmy goat, 0.0.2 Raul Raul, 0.0.1 Owl finch, 0.0.2 Bleeding heart dove, 0.0.2 Chattering lorry, 0.0.4 Black swan, 0.0.15 Society finch and 0.0.1 Hartlaub's touraco.

BROOKFIELD ZOO.....*John Stoddard*

Births and hatchings for February 1983 include: 0.0.3 Blue-grey tanager, 0.0.2 White-toothed shrew, 0.0.4 Spotted grass mouse, 0.0.2 Striped grass mouse, 0.0.6 Spiny mouse, 0.0.6 Jird, 0.0.1 Cuis, 0.0.2 Goeldi's monkey and 0.2 Collared peccary.

LINCOLN PARK ZOO.....*Randy McMahon/Susan Moy*

The following are the B&H for February 1983 at the New Lincoln Park Zoo: Birds - 0.0.2 Double-striped thick-knee. Mammals - 0.0.4 Geoffroy's tamarin, 0.0.1 Debrazzas guenon, 0.0.1 Springhaas, 0.0.1 Hoffman's Two-toed sloth, 0.0.1 Black leopard and 1.0 Grant's gazelle at the New Antelope and Zebra Area.

LAFAYETTE ZOOLOGICAL PARK.....*Annette Thatch*

Births and hatchings for the months of January and February 1983 include: 0.1 Aoudad, 0.0.4 Emu, 0.0.7 Black swan and 1.0 Bison. Recent additions are: 1.2 Gray-banded king snake, 1.0 Rainbow boa and 0.0.2 North American alligator.

DALLAS ZOO.....*Tamara A. Jones*

The births and hatchings at the Dallas Zoo for February 1983 include: Reptiles - 16+ Jackson's chameleon; Birds - 1 Gouldian finch, 3 Spur-winged lapwing (2 DNS), 3 Black-necked swan; Mammals - 1.0 Bongo and 1.1 Pygmy goat.



Coming Events

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 24-26, 1983

Pittsburgh, PA

13TH ANNUAL CONFERENCE/WORKSHOP OF THE INTERNATIONAL ASSOCIATION OF AQUATIC ANIMAL MEDICINE

May 1-4, 1983

Long Beach, CA

To be held at the Queensway Hilton Hotel. Contact Dr. Murray Dailey at the Dept. of Biology, California State University, Long Beach, CA 90840.

ANNUAL MEETING OF THE ANIMAL BEHAVIOR SOCIETY

June 19-24, 1983

Lewisburg, PA

To be held at Bucknell University. Persons interested in attending should contact: Douglas K. Candland, Animal Behavior Program, Bucknell University, Lewisburg, PA 17837. Deadline for advance registration is 1 May, 1983.

ANNUAL MEETING OF THE AMERICAN SOCIETY OF MAMMALOGISTS

June 19-23, 1983

Gainesville, FL

To be held at the University of Florida. Interested persons should contact: Jill Sandersen, Division of Continuing Education, 1938 W. University Ave., Gainesville, FL 32603.

In 1984, the American Society of Mammalogists will hold a joint meeting with the Australian Mammal Society in Sydney, Australia. Dates for the meeting are set for 9-13 July 1984. Questions and information concerning the meeting should be directed to: Dr. William Z. Lidicker, Jr., University of California, Berkeley, Museum of Vertebrate Zoology, 2593 Life Sciences Bldg., Berkeley, CA 94720.

THE 7TH REPTILE SYMPOSIUM ON CAPTIVE PROPAGATION & HUSBANDRY

August 3-6, 1983

Dallas, TX

Call for Papers: All herpetologists are invited to submit for consideration the titles of papers they wish to present. Paper lengths may range from 15 to 40 minutes. A preliminary program will be established by May. A 100-150 word abstract should be submitted prior to 1 May, 1983. Final manuscripts should be submitted by 1 June 1983. Submit all program information to Dr. Peter J. Tolson, Program Coordinator, Toledo Zoological Society, 2700 Broadway, Toledo, OH 43609.

5TH ANNUAL MEETING AMERICAN SOCIETY OF PRIMATOLOGISTS

August 7-10, 1983

Lansing, MI

For registration and further information contact: Dr. David M. Taub, Yemassee Primate Center, P.O. Box 557, Yemassee, SC 29945.

AMERICAN ASSOCIATION OF BOTANICAL GARDENS & ARBORETA AND

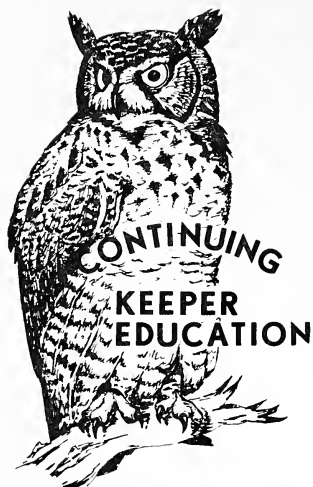
AMERICAN ASSOCIATION OF ZOOLOGICAL HORTICULTURISTS (Joint 1983 Meeting)

September 20-25, 1983

San Diego, CA

Pre- and Post-conference tours are planned for Sept. 20 & 25. Contact person is Jim Gibbons, Horticulturist, San Diego Wild Animal Park, Route 1, Box 725E, Escondido, CA 92025.





By
Judie Steenberg
Chairman, AAZK Education Committee

First our thanks to Bruce Clark for the owl logo. After graduating from Kansas State University with a B.S. in Wildlife Conservation, Bruce worked as a keeper at the Sunset Zoo in Manhattan, KS. He is currently an Assistant Mammal Keeper at Toledo and has offered to illustrate for the Keeper Education Committee in addition to working on other projects.

AAZPA ANIMAL HUSBANDRY TRAINING MANUAL REVIEW

This 1981 manual was written by Jim Ellis, Coordinator/Curator, Sante Fe Community College, Gainesville, FL. It replaces the "Zoo Keeper" training guide published by AAZPA in the late 60's, while they were still a branch of the National Recreation and Parks Association.

The manual contains 278 pages in a loose-leaf format that begins with a unit on Orientation and ends with a section of seven appendices. Units on the Basic Keeper, various levels of animal management and the classes of animals exhibited in Zoos are presented in outline form. Each unit gives references to the appendices for additional information and contains a bibliography. Articles and reference lists are found in some units.

The appendices contain information on: glossary, wildlife laws and information, organization histories and addresses, gestation and incubation periods, audio-visual materials, selected abstracts, journals and periodicals and general bibliography.

Have you seen your Zoo's copy of the AAZPA manual? Are you presently using it at your Zoo, or have you used it? If so, we would like to hear from you. If you haven't, you should see it. The manual is set up so that it can be adapted to your Zoo's needs in setting up a training or review program. All AAZPA member institutions received a copy of the manual as a membership service.

Keeper Education Committee members who have reviewed the manual all commented favorably on its usefulness as a basis for Keeper training and as a detailed manual on animal husbandry. It could be used to develop or enhance a general Keeper training program or to develop a series of seminars or lectures for continuing Keeper education within a Zoo. For the individual it could serve as a guide to self-education in animal husbandry. Most important, the Manual is available now.

Several suggestions were made for supplements that AAZK might consider producing. Information on modifying existing exhibits with materials and methods easily obtained and learned would help Keepers provide more natural environments. Audio-visuals to depict the practical aspects of animal keeping (slide packages on safety, restraint, ID/markings, etc.) for zoos that don't have programs was mentioned repeatedly. Zoonoses, sample forms

CONTINUING KEEPER EDUCATION, *Continued*

packets, nutrition (concepts and topics such as hay quality), and a slide program on orientation were also recommended. All suggestions are appreciated and will be given careful consideration. Before AAZK can decide to work on any of them as a project, we must first research the possibility that some of this information is already available to us.

Until then, the safety video tape is our first step. It will be a pilot project to give us a realistic idea of the time, effort and cost of producing audio-visual supplements. Once that has been determined and the tape has been produced, we must look at the practicality of producing and distributing it to our Zoos. There are months of work ahead to accomplish this first important task.

HELP WANTED

Liz McLaughlin and Jenny Rentfrow need your help with the reference search.

-Do you have proceedings from past AAZK conferences that were not published? If so, call Jenny at (517) 353-5280 and leave a message (she will return your call) or write to her at 1951 Eden Rd., Mason, MI 48843.

Also, they will be collecting reference information as follows:

Liz - amphibians, fish, invertebrates

Jenny - birds, mammals, reptiles

Please take time to send information on unpublished materials especially, you might have just the information another Keeper is looking for. The success of all AAZK Committees and their various projects depends on membership support.



Keeper's Alert

ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession.

The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. Presently any correspondence to the PSC should be broken down as follows:

Kevin Conway
NZP/Conservation & Research Center
Front Royal, VA 22630

MA,NH,VT,RI,ME,NY,PA,DE,CT,
WV,VA,MD,D.C.,NC,SC,TN,KY,
GA,AL,MS,LA,and FL.

Craig Moran
Dickerson Park Zoo
3043 North Fort
Springfield, MO 65803

OH,KS,NE,ND,SD,IN,IL,MI,MN,WI,
IA,MO,AR,TX, and OK.

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

WA,OR,CA,AZ,NM,CO,NV,WY,ID
and MT.



REQUEST FOR NOMINEES FOR AAZK AWARDS

In anticipation of the 1983 AAZK Conference, nominations for the Annual AAZK Awards are being accepted. There are three award categories: Excellence in Zookeeping, Certificate of Merit for ZooKeeper Education, and the Meritorious Achievement Award.

Excellence in Zookeeping

Qualifications:

1. The nominee must have been a full-time keeper, employed in any North American zoological institution or aquarium.
2. The nominee must have been employed at least two years on a permanent status at a zoo or aquarium.
3. The nominee must be nominated by his or her peers who have also been employed at that same zoo or aquarium.

Nomination Procedures:

1. List name, position, institution, years of service in the field and the recommendation of peer or colleague.
2. List outstanding achievements: exhibits, breeding, education, etc.
3. List any extra activities outside of zoo or aquarium work: Working with conservation groups, youth, wildlife officials, etc.

Selection Procedure:

The Awards Committee, consisting of five people, will independently review each nominee.

Certificate of Merit for ZooKeeper Education

Qualifications:

1. Any North American zoological institution or aquarium is eligible.
2. The keeper training program must have been in existence for at least a year.

Nomination Procedures:

This award will be given to the zoo most actively promoting educational programs for zookeepers--Keeper training courses, staff seminars, and reimbursement for formal education, etc. If you feel that your zoo merits such an award, please submit a letter of nomination, mentioning specific education programs.

The first award, EXCELLENCE IN ZOOKEEPING, is given to recognize outstanding people in the zookeeper field. Any keeper is eligible for the award and more than one award may be given each year. If five excellent keepers are nominated, five awards will be given. If none of the nominees qualify, no award will be given.

Excellence in zookeeping cannot be determined on the basis of an isolated breeding success or upon one spectacular instance, but rather, upon examination of the keeper's total performance. Each keeper has a slightly different idea of what his or her job entails. There are, though, basic themes which can be used in judging a keeper's performance.

Perhaps the most essential characteristic is commitment to the animals and to the profession. Commitment is defined as, "the state of being bound emotionally and intellectually to some course of action." This commitment is necessary because the needs of the animals often exceed the demands of

REQUEST FOR NOMINEES FOR AAZK AWARDS, Continued

an eight to five workday. Without this basic foundation of commitment, it is impossible to realize one's full potential as an animal keeper.

The next important quality is the ability to empathize. You must understand your animals' needs, both physiologically and psychologically and fulfill them the best you can.

In fulfilling the animals' needs, a keeper must have a knowledge of the animal's behavior, physiology, and natural history. This knowledge is essential to maintain the animals efficiently and effectively. Furthermore, a keeper should actively pursue greater knowledge of his or her animals through observation or private study. In addition, a keeper should be able to communicate this knowledge effectively to other keepers and to the public. At the same time, keepers should be receptive to the knowledge and experience of others. The task that keepers face is too difficult to be stingy with our own knowledge or disdainful of another's opinion. We must share our knowledge with other keepers and make the public aware of the intrinsic value of the animals we care for.

Finally, the keeper must function as the animal's representative in policy decisions and planning. A keeper may not be an expert on an entire order or even a particular family, but he or she should be an expert on the animals in his or her care. Therefore, since the animals can't tell us themselves whether a new cage is inadequate or a new situation too stressful, it is up to the keeper to represent their interests in zoo decisions.

These, then, are the basic criteria for examining the performance of a zookeeper. Any single area, isolated, is of little value. The ability to empathize with the animals is useless if you lack the knowledge and skill to improve their care. Similarly, knowledge and skill without commitment leads to a keeper who, "keeps his or her animals alive and nothing more". Each area must be evident in the good zookeeper. The excellent zookeeper will excel in one or more of these areas, but cannot lack any of them. If you feel that a keeper you know meets these criteria, submit his or her name, along with a brief letter describing why you feel they deserve the EXCELLENCE IN ZOOKEEPING award.

The next award, the CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION, is given to the zoo most actively promoting educational programs for zookeepers. Keeper training courses, staff seminars, and the reimbursement for formal education are obvious examples of such programs. If you feel that your zoo merits such an award, please submit a brief letter of nomination, mentioning specific educational programs at your zoo.

Meritorious Achievement Award

This award is given to professional members of AAZK or AAZK-affiliated chapters for outstanding achievement in the zoo field and related activities. This award is to cover activities outside the scope of the Excellence in Zookeeping awards. Any keeper of AAZK Chapter is eligible and more than one award may be given each year.

Unlike the Excellence in Zookeeping awards, this award may be given on the basis of isolated noteworthy breeding successes or other individual spectacular achievements. This would include such things as keeper participation in AAZPA Bean Award projects, individual breeding projects carried on outside the zoo proper, wildlife conservation efforts, zoo and wildlife education programs, and many other related activities.

REQUEST FOR NOMINEES FOR AAZK AWARDS, Continued

The guidelines for this award are broad and very general and cover almost any activity associated with zoos and wildlife; however, the persons receiving such must be professional animal keepers or AAZK Chapters in keeping with the goal of our organization, which is animal care.

Qualifications:

1. The nominee must be a full-time animal keeper, employed in any North American zoological institution or aquarium.
2. The nominee must have been employed at least one year on a permanent status at a zoo or aquarium, or in the case of an AAZK Chapter, must have been on active status for at least one year.
3. The nominee must be nominated by his or her peers. They need not be from the same zoo or aquarium.

Nomination Procedures:

1. List name, position, institution, years of service in the field, and recommendation of peer or colleague.
2. List the outstanding achievements: Exhibits, Breeding, Education, Conservation, etc.

Selection Procedure:

The Awards Committee, consisting of five people, will independently review each nominee.

PLEASE FORWARD ALL NOMINATIONS TO:

Mike Crocker
Awards Committee Chairman
c/o Dickerson Park Zoo
3043 North Fort
Springfield, MO 65803

Deadline for Nominations is 15 July 1983



Primate Profiles

A NEW HOME FOR TAMARINS AT THE GREATER BATON ROUGE ZOO

By

Linda Sanders, Primate Keeper
Greater Baton Rouge Zoo, Baton Rouge, LA

Cotton-topped tamarins (Saguinus oedupus) have been kept and bred at the Greater Baton Rouge Zoo since 1975. Unfortunately, due to lack of a suitable enclosure, they have not been on public display for most of this time. Recently, renovation of an existing exhibit had made it possible to show these animals to fascinated visitors for the first time.

From 1975 to 1978, the tamarins were housed in temporary quarters near the zoo kitchen and hospital service area. In late 1978, four family groups of cotton-topped tamarins and one trio of common marmosets (Callithrix jacchus) were moved to another off-exhibit area located in a remodeled zebra barn. Each family had indoor and outdoor partitions made of wood and welded wire with concrete floors. During the next three years, most of these animals were sold or loaned to other zoos until only one family of 2.2 cotton-topped tamarins remained. This group consisted of a seven-year-old female, a five-year-old male, and their 1.1 offspring from 1981.

The year 1982 was a year of declining health for these animals. New twins born in the spring died at nine weeks of age. In addition, the other tamarins almost quit eating altogether and were becoming very thin. It was felt that a change was definitely needed for these animals if they were to survive their depressed state.

While health changes were being observed in the tamarins, our bird house was being renovated to alleviate a predation problem. Standard chain link was replaced on all outdoor fences with one-inch chain link. This new smaller fencing gave rise to the idea that the tamarins could be housed there with no possibility of escape. This would involve mixing them with some of our bird species in a naturally planted, spacious exhibit.

Several discussions followed this proposal. What new changes would have to be made to accomodate the tamarins? More importantly, which bird species could they co-exist with best? A pair of great curassows (Crax rubra) were selected as the birds most likely to succeed as cagemates for the tamarins. Our birds are reasonably calm and are also a South American species which made them more desirable to mix with the South American primates.

The curassow display area consists of a 15-foot wide by 13-foot long by 8-foot high outdoor enclosure with natural substrate, several small trees and shrubs, and a small concrete pool. A roof overhang extends approximately seven feet into the area with a heat lamp attached under it near additional perches. Access to a small indoor area in the heated hallway was provided for the tamarins. Their food could also be placed indoors, away



A NEW HOME FOR TAMARINS AT THE GREATER BATON ROUGE ZOO, *Continued*

from the curassow feeding station. The building onto which the bird exhibits are built is situated in such a way that the curassow enclosure faces east and is protected by walls from north and west winds.

Moving day was 10 December 1982. The four tamarins were kept overnight in the indoor area to accustom them to the warm, safe shelter where food was available. Their release into the bird-occupied area took place the next day. The first tamarin to try exploring was the adult male who tentatively approached the pair of curassows. The male curassow stood his ground, raised his wings, and the tamarin quickly scampered away. Several similar encounters have been the only interaction between the species.

Being too cautious to try the strange new trees and shrubs, the tamarins spent most of the first several days hanging onto the fence. Also, they stayed mainly toward the back of the exhibit where they could not be seen easily by the viewing public. Confidence gradually replaced cautiousness and they began to explore all areas and levels of their new home.

December 19, 1982, only nine days after their transfer, excited screaming was heard in the exhibit. The bird keeper quickly investigated and discovered the adult male tamarin had caught a sparrow through the fence and was trying to pull the struggling bird into the enclosure! The tamarin succeeded in decapitating the bird, but the body fell out of his reach. This type of behavior had never been observed prior to the tamarin relocation.

It has been over a month since the tamarins were moved to the birdhouse and things seem to be going very well. The tamarins' appetite has increased and they appear well-adjusted and healthier already. There have been no problems so far between the birds and the primates. More time will be necessary to determine the success of this experiment. Presently, one of the most positive aspects of the situation has been that we are finally able to have on public display such interesting and unusual animals as the cotton-topped tamarins.

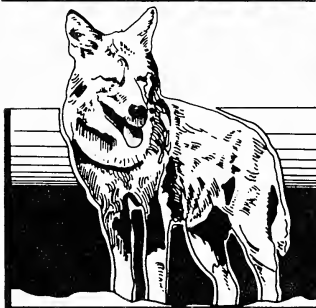
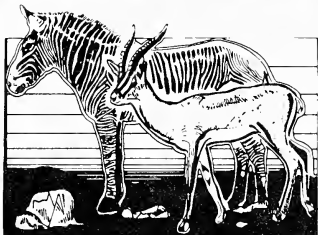
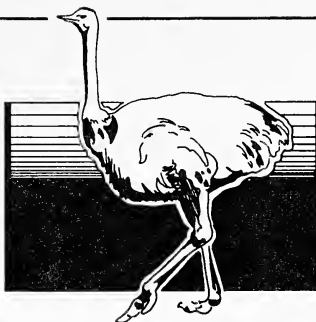
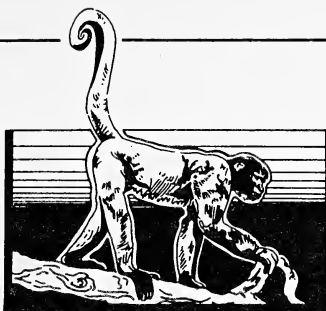


Information Please

Anyone having information as to a zoo which might be interested in acquiring a friendly, weaned Yorkshire piglet (*Sus scrofa*) is urged to write Diane Lord, 2 Penn. Ave., Spring Lake, NJ 07762, or call (203) 429-3990, 24 hours. Ideal for children's zoo. White fur, blue eyes, prefers zoo life to being a pork chop.

Request any information or literature on the Asian small-clawed otter, (*Aonyx cinerea*). Any assistance would be greatly appreciated. Send any information to: Joe Fontanetta, Keeper, Small Mammal House, Lincoln Park Zoological Gardens, 2200 N. Cannon Drive, Chicago, IL 60614.

PRIMATE INFO.! We are interested in obtaining information on birth control techniques in primates. Also, any information or techniques used in forcing females to accept their infants. Send information to: Louise LaRoche, Lafayette Zoological Park, 3500 Granby St., Norfolk, VA 23504. Thanks!



for your
captive
audience

Spectrum offers
a complete line of
High Quality
Food Products,
and we're proud of
the Professional Service
we give our Customers.

Zu/Preem

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

EXCLUSIVELY DISTRIBUTED BY



Animal SPECTRUM Inc.
5801 Locust Street
Lincoln, Nebraska 68516

Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-6492

GRASS ROOT GENETICS....Part Four

"PEDIGREES"

By

Dora Jacobs, Keeper
Rio Grande Zoo, Albuquerque, NM

A pedigree is a chart of the ancestry of an individual. Those who trace their own genealogy are making their own pedigree, which is popularly called a "family tree" when framed and put up on the mantelpiece. If we have pictures and medical histories of the people in our pedigree, we can map some of our own genes for such traits as skin, hair, and eye color, genetic defects and diseases, height, temperament, talents, and the like. The defects can be hard to dig up if the family doesn't want to discuss them. The same principles are true of tracing an animal's pedigree. It can be of great use in setting up a breeding program if genetic information is available concerning the ancestors. Breeding without a pedigree is pure gambling.

Pedigrees have been maintained for thousands of years. Ancient Egyptian horse pedigrees show the inherited characteristics in simple drawings of the individual animals. Modern American pedigrees are read from left to right, starting with the animal under discussion and progressing to the right with its parents, grandparents, etc. The sire's line is on top and the dam's on the bottom. Arabian horse and dog pedigrees in their native land show the dam's line on the top and the sire's on the bottom. After all, we can usually be sure who the dam is, but the identity of the sire is not always guaranteed. Pedigrees can also progress from top to bottom, as human geneologists tend to.

ISIS, the international zoo registry of captive wild animals, does not as yet keep pedigrees, although there is a movement afoot to do so. At present, one can laboriously trace the known ancestry of captive specimens through breeders and previous owners, if one has lots of time and a high frustration tolerance. ISIS in itself is a giant step toward the goal of responsible captive breeding. Ideally, a pedigree should show genetic codes insofar as they are known, but no present registry keeps track of them. Some genetic information is indirectly given, however, such as the stars on a goat pedigree to indicate documented heavy milkers and sires of star milkers, earned conformation titles such as "champion", and other titles or registrations indicating the passing of tests of production, soundness, or ability.

By way of illustration, below is a sample pedigree for an imaginary Black and Tan Coonhound. Let us say we are considering breeding our Coonhound bitch to him.

Before we request a breeding, we should see the dog in person, plus any of his relatives we can get our eyes on, in pictures if the animals are dead or living in Guam. We should look up their show and field records to see whom they beat and who beat them. We should watch them move and see them work if possible. We should try to make friends with them and see how they interact with other dogs and people. We should feel them over to spot any defects their owners do not advertise. Then we should try to figure out their hereditary traits and identify their genes. Sound like a lot of work? It is. Conscientious breeding is a lot of work. We

GRASS ROOT GENETICS -- PEDIGREES, Continued

also need to try and predict how that stud's genes will combine with our bitch's genes and what kinds of puppies they can make together. Before we do any of the above, we should have done the same process on our own bitch and her relatives and then set goals for how we want to reproduce her best traits and eliminate her worst ones, at least any that are unhealthy. We should try by breeding to get at least one puppy that is better than both parents, most of them at least as good as both, and none that are worse than either parent. Needless to say, if the breed is not so rare that it is in danger of extinction, no bad specimen should ever breed to anybody.

On the pedigree and its interpretation:

```

                                Ch Full House Jack of Diamonds, ROM
                                sire's sire
        Ch Full House Ace in the Hole OTCh
        sire
                                Ch Full House Queen of Hearts, CD
                                sire's dam

Full House Ace High
registered name
                                Ch Full House Jack of Diamonds, ROM
                                dam's sire

        Fld Ch Full House Deuces Wild, UDT
        dam
                                Full House Club Flush, CDX, TD, PR
                                dam's dam
```

Breed: Black & Tan Coonhound
Breeder: Full House Kennels
Birth Date: 1/1/1990
AKC#: SF123456
OFA#: BP234567
TT-987-BTC

This is a line breeding of the grandsire, CH Full House Jack of Diamonds, a producer of enough champions to list him in the breeder's Register of Merit.

The letters before and after the names are the titles earned in competition. They are as follows for this pedigree:

Ch: Champion Earned in the show ring for conformation, temperament and movement.
Fld Ch: Field Champion Earned in Coon dog field trials
CD: Companion Dog First level Obedience Trial title.
CDX: Companion Dog Excellent Second Level Obedience title.
UD: Utility Dog Highest level Obedience title.
TD: Tracking Dog Tracking Trial title.
UDT: Utility Dog Tracker Combination title.
OTCh: Obedience Trial Champion Has beaten many at highest level.
PR: Perro Rastreador Mexican Tracking title.

GRASS ROOTS GENETICS -- PEDIGREES, Continued

The OFA number means that the dog's hips are free from dysplasia according to an X-ray evaluation by a national board. The TT number means that the dog has passed a temperament test for mental stability. The Breeder is the owner of the dam at the time of mating. Full House is the kennel name of the dog's breeder.

This looks to be an outstanding pedigree, but other than having sound hips, temperament, and proper color for the breed, the dog could be a complete dud if the parents were not well matched. If the parents were well matched, the animal would not only be an excellent specimen, but it would be a consistent breeder as well.

Of course, wild animal pedigrees will be full of boring numbers instead of romantic names. Not only are boring numbers easier for a computer to keep track of, but one soon runs out of romantic names for wart hogs. Those numbers will be able to unmistakably pinpoint the individual animals used for breeding, and thereby prevent the confusion which arises from such situations as, "Was that Polar Bear San Diego's Frosty or Lincoln Park's Frosty?"

Careful breeding is so important to zoos that a zoo worker really needs to know how it works in order to be a real asset to the zoo. If we know what is going on in the breeding populations, we can often pick up important beneficial or detrimental traits in the animals from our every day observations of the animals in our care, and point them out to the people who arrange and control the breedings that are allowed among our animals. We can also sharpen our knowledge by learning to predict the products of those breedings.

Bibliography for this series:

Muntzing, Arne: Genetic Research. Stockholm, Sweden; Neijels Bokindustri, Halmstad, 1961.

Jude, A.C.: Cat Genetics. Fond du Lac, Wisconsin; All-Pet Books, Inc. 1955.

Kidd, Randy: "The Amazing Irish Dexters," The Mother Earth News, 62:71, March-April, 1980.

Dalzell, Bonnie: "Practical Genetics," The Irish Wolfhound Quarterly, Vol. 4, No. 3, 19-21, Winter 1981-82.



[Editor's Note: Part 1 of this series on Grass Root Genetics can be found in the October 1982 issue of AKF; Part 2, "Genetic Complications" can be found in the November 1982 issue of AKF and Part 3, "Animal Breeding" can be found in the March 1982 issue of AKF.)

REPAIR OF THE PLASTRON
OF AN ORNATE BOX TURTLE
USING A RAPID POLYMERIZING
POLYESTER RESIN

Reptile
Amphibian
potpourri

By
Hank Guarisco
Animal Care Unit
University of Kansas, Lawrence, KS



On 2 June 1980, a large (0.463 kg) female ornate box turtle (*Terrapene o. ornata*) that had been injured on a highway in the vicinity of Lawrence, Ks was brought to the Museum of Natural History of the University of Kansas. Examination revealed extensive trauma involving the bones underlying the abdominal and femoral scutes on both sides of the plastron, near the juncture of the plastron and the carapace. This resulted in the plastron, which was no longer connected to the carapace, being drawn up into the carapace by muscle contraction.

The turtle was taken to the University's Animal Care Unit for treatment. Before realigning the plastron and carapace, an anesthetic was administered. Using a 25-gauge needle, four intramuscular injections of a combination of ketamine hydrochloride, promazine hydrochlorine, and aminopentamide hydrogen sulfate [Ketaset^R Plus, Bristol Laboratories, Div. of Bristol-Myers Co., Syracuse, NY] was given in the dorsolateral region of the front legs. A total of 70 mg was administered over a period of 85 minutes to maintain an adequate level of anesthesia.

The traumatized area was thoroughly cleansed with physiological saline solution (0.9% NaCl). Using a spatula and a pair of forceps, great care was taken to remove dirt particles and shell fragments. The entire area was then rinsed with a povidone-iodine solution (Prepodyne^R solution, West Chemical Products, Inc., Lynbrook, NY), to decrease the chances of bacterial infection. To achieve proper realignment of the carapace and plastron, I inserted my finger in the right inguinal pocket and applied downward pressure on the plastron while holding the carapace with the other hand. A similar procedure was used on the left side, resulting in proper realignment. The area was again cleansed with a povidone-iodine solution, rinsed with physiological saline, then thoroughly dried using an air stream at room temperature from a compressed air line present in the room. A small amount of hardener was added to a rapid polymerizing polyester resin (NAPA BALKAMP^R Fiberglass Repair Kit (765-1281), Napa Automotive Parts and Accessories, Lawrence, KS) and this mixture was applied to two pieces of fiberglass cloth that had been placed on top of the broken areas. In a matter of minutes the resin had hardened. The turtle was then placed in a supine position under a chemical hood overnight with an exhaust fan in operation to facilitate the complete hardening of the polymer.

The next day, 12.5 mg of gentamycin sulfate (Gentocin^R Elkins-Sinn, Inc., Cherry Hill, NY) was administered IM as a further precaution against infection. Gentamycin sulfate is considered to be the most effective antibiotic for treating a wide variety of reptile infections. Since this antibiotic is excreted via the kidneys, however, it is important to prevent its buildup in the plasma to potentially toxic levels due to dehydration (Frye, 1981). Therefore, the turtle was placed in a pan of water

REPAIR OF THE PLASTRON OF AN ORNATE BOX TURTLE, Continued

every day for about an hour, and was observed to make sure it was drinking. On 5 and 6 June, two more injections of gentamycin sulfate (10 mg each) were administered. The turtle was housed in a 5-gallon aquarium during convalescence. On 10 June, eight days after the turtle was injured, fecal material was noticed in the aquarium for the first time. It consisted mostly of grass stems and dirt. No blood was present, suggesting that internal damage was minimal. For the next month, fecal matter was excreted at irregular intervals, even though no food was consumed during this time. The subject began to show interest in food during the end of June, but did not resume feeding until 25 July.

After recovery, the turtle was donated to the Office of Public Education of the Museum of Natural History where it has resided with two other ornate box turtles until the present date. The epoxy resin should be removed from the edges of the scutes after about a year to allow normal growth of the shell (Frye, 1973). The average length of adult ornate box turtles in Kansas is 100-126 mm (Collins, 1974). Since the turtle was 126 mm in length, it is unlikely that substantial growth will occur, making it unnecessary to remove the polyester resin. However, in the Fall of 1981, both fiberglass casts became separated from the shell and were discarded. The traumatized areas appear to be completely healed. This method and other effective techniques that have been used to repair the damaged shell of chelonians have been recently presented (Frye, 1981)(Marcus, 1981).

Acknowledgments:

I acknowledge the technical support of John B. Mulder, DVM, of the Animal Care Unit, and Mr. John E. Simmons of the Division of Herpetology, Museum of Natural History, University of Kansas. This work was partially supported by grant RR07037 from the Division of Research Resources, National Institute of Health.

References

1. Frye, F.L: Biomedical and surgical aspects of captive reptile husbandry. Veterinary Medicine Pub. Co., Edwardsville, KA 1981
2. Frye, F.L: Clinical evaluation of a rapid polymerizing epoxy resin for repair of shell defects in tortoises. VM/SAC 68:51-53, 1973
3. Collins, J.T: Amphibians and reptiles in Kansas. Univ. Kans. Mus. Nat. Hist. Pub.Ed. Ser. 1: 1-283, 1974
4. Marcus, L.C: Veterinary biology and medicine of captive amphibians and reptiles. Lea & Febinger, Philadelphia, 1981



There is a supply of free Animal Data Transfer Forms for all Zoos and Aquaria, courtesy of AAZK. Contact: Bernie Feldman, Miller Park Zoo, 1020 S. Morris Ave., Bloomington, IL 61701.



Bird Calls

WATERFOWL BREEDING PROGRAM IN THE BIRMINGHAM ZOO

By
Donna Mason Smith, Keeper
Birmingham Zoo, Birmingham, AL

February 1982 brought a new keeping staff to the Bird and Reptile Department of the Birmingham Zoo. With them began the first cooperative, organized efforts to increase and stabilize the productivity of the waterfowl maintained on the three large "duck ponds". While the numbers presented here may not inspire awe in the reader, they can be appreciated by those who have struggled to instigate new ideas and procedures and can encourage those who find themselves in similar circumstances to persevere.

The breeding program concentrated on three main areas:

1. records
2. nesting facilities and substrate
3. artificial incubation and hand-rearing

The following is a brief description of the program and a discussion of problems, solutions, and final results.

Out of fourteen species housed on the ponds, twelve were included in the breeding program. The two species excluded were mallards (Anas p. platyrhynchos) and the American white pelican (Pelecanus erythrorhynchos). Mallards have been so successful on their own that their numbers have reached near pest proportions, with approximately 150 living on the ponds by July this year. Our single pelican's only contribution could be to eat newly hatched ducklings. However, he did not cause any problems as all the young were raised off-display. Both of these species will be ignored for the purpose of this report unless specifically mentioned.

The general lay of the enclosure consists of three large, interconnected ponds surrounded by a combination of concrete and stone land areas as well as soil, grass and shrubs. In addition to nest boxes, a large concrete castle-like structure on an island in the lower pond offers shelter that is rarely used except during breeding season.

RECORDS: As the season progressed, the bugs worked themselves out of the record system. Notes kept on eggs in the incubator as well as a map of the nest sites pointing out who was on what nest proved to be of value. A calendar of daily notes on behavior and nesting progress was posted in a prominent place. This kept everyone abreast of new developments regardless of off days, vacation days, etc. that might have made personal contact between the staff impossible. This sense of continuity cannot be overly stressed. Not only does the success of a current program depend on it, but the ability to learn from past mistakes rests on the reliability of the record system.

NEST SITES & SUBSTRATE: After thoroughly scrubbing and disinfecting all concrete, stone and wood surfaces available to the birds, a variety of nesting facilities were placed about the area. Imagination was allowed to flourish and any type site that might be attractive to a female in the maternal frame of mind was set up. Some proved successful while others

WATERFOWL BREEDING PROGRAM IN THE BIRMINGHAM ZOO, Continued

were ignored. The record system comes into use here in helping prepare for next season by pointing out preferred nest types and areas around the ponds. Once territorial and/or nesting behavior began, no more cleaning was done near nest sites until the season was over.

ARTIFICIAL INCUBATION & HAND-REARING: During the course of the year two incubators were used. A still-air model #11400-3 produced by the Brower Mfg. Co., Quincy, IL was in service from 7 February to 20 May. Precise temperature was difficult to maintain and there was no hygrometer to monitor humidity. Eggs were hand turned which meant the entire top was taken off the incubator several times a day allowing frequent fluctuations in both humidity and temperature.

A Humidaire incubator, model #21, produced by Humidaire Inc., Co., New Madison, OH, arrived on 18 May and was put into use on 20 May. Wet bulb and dry bulb thermometers offered greater control over the eggs' environment. Automatically tilting trays reduced the need to open the incubator and therefore reduced the amount of variations in temperature and humidity.

Methods in hand-rearing varied according to circumstances. Generally, eggs were set so there would be no single hatches and several birds were raised together regardless of species. In these cases very little handling was necessary. When single hatches were unavoidable, the individual birds were imprinted on their human caretakers and were later introduced to other ducklings for companionship. These animals demanded much more time and attention. Preferably, the birds would have been taken home by their adopted keeper to insure consistent, maximum care for the first week. However, the zoo's quarantine procedures prohibited this practice. Besides the personal enjoyment of the keeper working with them, it soon became clear that the imprinted birds helped calm wilder ducklings placed with them. Consequently, these ducklings suffered less from stress and panic.

Ducklings were pinioned ideally within 24 hours of hatching. All birds were banded, inoculated against botulism, and released on the ponds when they had fully fledged.

DISCUSSION

Most of the nesting facilities were placed around the upper pond (36%) and the "castle" pond (51%) primarily because they offered the most land area. The former had very heavy vegetation along a terraced bank at the west end where boxes and stumps were placed and was furthest removed from public access. Although from the keepers' point of view these sites looked most appealing, they were virtually ignored with the only activity focusing on three cavity boxes on platforms over the water.

The "castle" pond presented the opposite in atmosphere. The available land area was level and open with little vegetation or cover and the entire enclosure was surrounded by public sidewalks that followed the fence-line. Just after the season started, about half of the land area was taken when heavy construction on a new sewer system necessitated moving the perimeter fence to water's edge along one side. Despite this interference, fourteen out of eighteen sites were used, or 74% of all sites utilized on all three ponds were located here.

Construction extended down the entire length of the three ponds on their southern boundaries. It is impossible to assess the total effect this had

WATERFOWL BREEDING PROGRAM IN THE BIRMINGHAM ZOO, Continued

on courtship and nesting behavior. Perhaps when considered with the relatively young age and lack of experience of the breeding stock some explanation of the high rate of infertility can be assumed.

Predators and theft took their toll on the number of eggs collected. Until the new incubator arrived clutches were split between the hen and the incubator to insure success one way or another. Those left in the nest proved easy prey to both human and nonhuman animals. (Statistics used in this report do not consider these eggs in their figures.) Next season all eggs will be pulled and incubated to safeguard against egg loss and to reduce the chance of losing a hen protecting her clutch.

Casual attitudes of people not involved in the breeding program resulted in unauthorized handling of both eggs and ducklings. Candling eggs and opening incubators unnecessarily increased the chance of damage to the developing embryos. Cleaning and feeding of ducklings by others interfered with the keepers' ability to monitor the bird's consumption and output. One duckling died after being dropped as its cage was cleaned in such a situation.

The geese presented unique problems in that the only breeding females were barheads (Anser indicus) who preferred males of other species. In past years, a barhead /snow goose and a barhead/greyleg were hatched. A new male was purchased and released on 14 February, but the females passed him up for the new barnacled geese (Branta leucopsis) released on 9 May. All eggs laid were infertile. In the past, offending males have been removed from the exhibit. This fall the barheads will be moved to other quarters in hopes that the remaining geese will bond with their own species.

The pair of coscoroba swans (Coscoroba coscoroba), in the past, have laid eggs on a floating platform formerly anchored in the center of the ponds. The fertility of the eggs was unknown since they were not incubated. Re-establishing floating platforms should draw the interest of the coscorobas as well as some of the other birds.

Equipment and facilities were scarce. Eggs were candled with a 300 watt spot light placed under an upsidedown clay flower pot. Lab cages that once held rabbits for the petting pen served as brooder boxes. Space was limited and older ducklings were moved to an ibis display and into unused winter quarters.

Several species of ducklings were hand-raised together. Each species demonstrated behavioral characteristics that appeared to be peculiar to that species. With the low number of ducklings that were observed, these notes cannot be considered conclusive but they serve as a basis in preparing for new hatchlings.

Wood duck (Aix sponsa): None were imprinted by humans so they were rather wild and would climb or jump without hesitation or discretion to avoid being handled. Care was taken to avoid injury or escape. A little slow to start eating, live meal worms scattered over water soaked chick starter got their interest. Tadpoles, minnows, and shredded escarole were favorites.

Mandarin (Aix galericulata): Only one specimen hatched, was imprinted and, after a few days, paired with a mallard duckling. This bird was the calm-

1982 WATERFOWL POPULATION

Species	Population		Egg Production			TOTAL
	breeding stock	max age	infertile	dead in shell	hatch	
wood duck (<i>Aix sponsa</i>)	10.7 (0.2)*		17	5	19 (10)*	40
mandarin (<i>Aix galericulata</i>)	3.4	7-3	4	6	1	11
hooded merganser (<i>Mergus cucullatus</i>)	2.2 (0.1)*	1-2	5	0	2 (2)	7
rosy-billed pochard (<i>Netta peposaca</i>)	3.3	1-5	1	1	4 (1)	6
red-crested pochard (<i>Netta ruffina</i>)	2.1	2-5	3	1	0	4
redhead duck (<i>Aythya americana</i>)	3.2	8-2	3	1	2 (1)	6
Baer's pochard (<i>Aythya baeri</i>)	2.1	2-4	1	4	2 (2)	7
marbled teal (<i>Marmaronetta angustirostris</i>)	2.2 (0.1)*	2-5	8	0	0	8
barhead goose (<i>Anser indicus</i>)	0.4 (1.0)**	10-2	7	0	0	7
Canada goose (<i>Branta canadensis</i>)	0.0.2	1-7				
barnacle goose (<i>Branta leucopsis</i>)	0.0.1 (0.0.4)**	2-5				
coscoroba swan (<i>Coscoroba coscoroba</i>)	1.1	17-10				

* did not survive

** received

max age - maximum age of specimens noted in years-months as of Feb. 1982.

COMPARISON OF 1981 & 1982 BREEDING SEASONS

species	hatch	-1981- release	% survival	hatch	-1982- release	% survival	1982/1981
wood duck (<i>Aix sponsa</i>)	16	8	50%	19	9	47.4%	13% increase
mandarin (<i>Aix galericulata</i>)	0	-	-	1	1	100%	increase
hooded merganser (<i>Mergus cucullatus</i>)	0	-	-	2	0	0%	no change
rosy-billed pochard (<i>Netta peposaca</i>)	0	-	-	4	3	75%	increase
redhead duck (<i>Aythya americana</i>)	0	-	-	2	1	50%	increase
Baer's pochard (<i>Aythya baeri</i>)	0	-	-	2	0	0%	no change
TOTAL	16	8	50%	30	14	46.7%	75% increase in 1982 over 1981

WATERFOWL BREEDING PROGRAM IN THE BIRMINGHAM ZOO, Continued

est of all the birds raised and didn't startle easily. It ate well and dominated the mallard even though it was quickly outgrown by the mallard.

Hooded merganser (*Mergus cucullatus*): Very independent and aggressive, when imprinted they demand attention by jumping and climbing the sides of their pen insistently. To avoid injury during the night, the ducklings were placed in a covered, ventilated plastic shoebox with a rag for bedding. Nothing seemed to intimidate them. They would walk to the edge of the table, look down at the floor, then step off. Live food and trout chow were favorites. The second bird hatched didn't like water until about four weeks of age when diving was discovered and thereafter practiced with relish.

Redhead (*Aythya americana*): One bird was hatched. Its favorite activity was running up and down the length of the counter flapping its feet noisily. Paired with the second merganser hatched, "Rupert" idolized "Madge" and followed her everywhere. He enjoyed diving and swimming underwater long before Madge would try it. Live food and trout chow were favorites.

Rosy-billed (*Netta peposaca*): All three hatched were imprinted. Calm birds that were quite aware of drop-offs, they would rush off the edge of a table if their adopted parents left their sight. Greens were favorite foods.

Baer's pochard (*Aythya baeri*): Two hatched very late in the season and survived only two days. Autopsies revealed nothing unusual. Shredded greens and yellow foods such as ground corn interested them most.

Mallards (*Anas platyrhynchos*): Rearing them was never a problem. They ate well and were hardy ducklings. Eggs were used to test the incubators by seeing how well they turned out and ducklings were used as companions and teachers for other species. Frequently a mallard could get a bird eating when all else failed.

Ducklings of different ages were carefully worked in together and watched closely. Older birds would attack and kill smaller ones not recognized as members of their clutch if given the chance. A little supervision got them through the introduction period safely. At two to four weeks, the birds were moved to the brooder pens mentioned earlier.

The 1982 Waterfowl Breeding Program with its three facets was simple and basic. This was necessary to begin the changes needed in both old attitudes and established routines. Learning new procedures, developing scheduled, and changing work patterns involved an effort frequently unrecognized. The development of a reliable record system and the sense of teamwork between keepers was an accomplishment in itself. These indirect results of our efforts were perhaps some of the most important and the most difficult to obtain.

This year saw an increase of 75% in the number of ducks reared and released over last year's production. However, the success of our program is not judged by the volume of ducks hatched or released, but rather by the variety of species raised. Where as in 1981 only one species was successfully reared, six species produced viable eggs and specimens from four species were released on the ponds in 1982. We expect 1983 to be even better.



RESEARCH NEWS

Research Grants Available

By Frank B. Kohn, Chairman
Research/Grants Committee

Here is your chance to conduct that study that you've kept tucked away in the corner of your mind. Keeper grants of \$250.00 or less will be offered four times a year in order to accomodate projects studying seasonal events. Grants are awarded for a one-year period with a possible one-year extension. Studies may include cooperative zoo-university staff providing that a keeper is the principal investigator.

Starting periods for grants are July, October, January and April. We are now seeking proposals to be funded starting in July. Proposals are due 1 May, 1983. October, January and April grant proposals will be due on 1 July, 1983; 1 September, 1983; and 1 January, 1984 respectively, for those interested in planning for seasonally-regulated topics.

Grant money is to offset costs of supplies (e.g. paper, small equipment, lab costs) and may not be used to cover salary expenses, phone calls, books or travel.

Current studies being funded by an AAZK keeper grant as well as other grants are: Diagnostic Atlas of Reptile Intestinal Parasites, Sue Barnard(Atlanta) principal investigator; Investigation into Maintaining, Breeding and Exhibiting the Tailed Frog, Stanley Held, Washington Park Zoo; and Captive Maintenance of the Echidna, Connie Cloak, Topeka, and John Brannian, Kansas City.

Guidelines For Proposals

Proposals should be approximately .3-4 typed pages, double spaced. The introduction ($\frac{1}{4}$ - $\frac{1}{2}$ page) should summarize your study subject and proposed investigation and describe what value the study's results will yield. The methods section ($\frac{1}{2}$ -1 page) should include methodology - that is, how you plan to study your topic and what equipment would aid in the investigation. A sample checksheet can also be submitted. Proposed relevant analyses of results should also be included here. A third section if for references relevant to your study. The final section should include a listing of supplies and expense needs followed by a short paragraph justifying these expenditures.

An example of a proposal follows:

"Cockroack Propagation Techniques"

Introduction

This study seeks to ascertain procedures for raising cockroaches in a humid, southern city. The results will be useful in determining reproductive parameters for this insect to aid zoos in saving this fascinating and truly valuable creature from extinction.

Method

This one-year study will utilize U.S. Army starlight scopes to observe nocturnal movements, and a Hasselblad camera to document activity. Observations will be made on a nightly basis. Stopwatches will be used to record duration of various behaviors. Checksheet will be used to record the following behaviors: Autogrooming, antenna breakage, courting copulation, love & death.

References

Cockroaches in My Kitchen, Derald Gurell, Rhea Press.
Cockroach Behavior: A Genocidal Approach, 1782, AEIOU Hodgking Press
Farming Cockroaches for Aggravation, U.S. Dept. of Interior Decorating,
Pueblo, CO.

Expenses

Film.....	\$200.00
Stopwatch.....	34.50
Paper.....	10.00
Xeroxing.....	5.50
	<u>\$250.00</u>

Justification of Expenses

Starlight ultraviolet scopes will be borrowed from a local naval base. The camera is owned by myself. Funding is needed for film, stopwatch, paper and use of a copy machine. The results will be submitted for publication in the Journal of Cockroach Behavior.



Book Review

Nature Discoveries With a Hand Lens

By Richard Headstrom
Published by Dover Publications, Inc.,
180 Varick St., New York, NY, 10014
1968; 412 pp., illus., \$6.00



*Review by Karl Guhm, Zoo Educator
Roeding Park Zoo, Fresno, CA*

Nature Discoveries is a pleasant addition to one's bookshelf, if one lives in the Eastern United States. This book is not a field guide nor a how-to-find-it book. It is for armchair naturalists or people who have thought of looking at the natural world through a hand lens. A sufficient number of field guides is needed to supplement the text.

Climatic changes and their resulting influence on plant and animal life are dealt with in a monthly manner. The author's prose style lapses into anthropomorphisms which give mice "winter adventures," robins and bluebirds "domestic thoughts," and describes the Great Horned Owl as a "disturbing...eerie...nameless terror that strikes fear into the hearts of the woodland creatures."

The strength of the book lies in its treatment of the insects and their kin. Descriptions of their behavior, illustrations of body parts and their uses are especially conducive to a hand lens approach. With this group or organisms, Headstrom even tells where and when and how to find the subjects.

Replacing some of the wordage with more illustrations would have resulted in a more realistic book. Tree bark, leaf margins and surfaces, stones and even soil would have made practical additions to the hand lens user. Headstrom did accomplish an important task by making the insect world better known. Overall it is a pleasant book to read.



Chapter

By Patti Kuntzmann
Coordinator for Chapter Affairs

Norfolk AAZK Chapter

As of January 1983, the officers are as follows:

President.....Louise LaRoche
Vice President.....Denise McKinney
Treasurer.....Bonnie Larson
Secretary.....Tamara Nance

Chapter projects include preparations for the 2nd annual "Spring Arts at the Zoo". They sent \$25 to the Whale Protection Fund. They have taken action by sending letters to congress persons and senators expressing their views. We all talk about these problems, but few of us take action. We're glad to see that some of our chapters are doing just that, taking action!

Memphis Zoo AAZK Chapter

In elections held in January, the following individuals were elected as officers of the Memphis Chapter:

President.....Bob McGuire
Vice President.....Cathy Harrison
Secretary.....Kathy Goble
Treasurer.....Robert Evans

Dallas Zoo AAZK Chapter

Newly elected officers of the Dallas Chapter are:

President.....Ken Kaemmerer
Vice President.....Lynette Shirley
Sec/Treas.....Tami Jones
Communication Coordinator...Nancy Carter
As an ongoing fund-raiser, the Chapter has purchased a Polaroid camera and sells pictures of visitors posing with various zoo animals. The Chapter also purchased a balance scale and donated it to the Zoo for use in weighing baby animals in the Hoofed Mammals Dept. The group is also promoting their profession to the general public and has participated in two Career Days, given animal programs to civic groups and assisted the Dallas Docents in The Southwest Living Show. In the future, they hope to present wildlife films for the public. The Chapter is also having a Chapter Logo contest with the prize being a year's membership in National AAZK.

The Chapter donated \$72 to the World Wildlife Fund. They saved two acres of a rainforest wildlife preserve in Columbia. Also. \$75.00 was given to five zoo keepers attending the AAZPA Management School in Wheeling, WVA for traveling expenses. They are also branching out and doing programs at elementary schools.

News

Brookfield Zoo AAZK Chapter

There is some generated interest again! Keep trying, Brookfield! The AAZK really needs you! Officers at Brookfield are:

President.....Jan Ramer
Vice Pres.....Ann Marie Laird

South Florida Chapter (Miami)

This resourceful Chapter raised \$378 holding their 3rd annual "Dog Wash". They donated a total of \$500 to Dreher Park Zoo to pay for the supplies needed to build a Goeldi exhibit. The AAZPA Newsletter even thought it was important enough to mention! We are very proud of your Chapter, too.
The Miami Chapter has also been chosen as coordinator for the AAZK Diet Notebook Project.

In November they held a "Slave Auction". If you are curious and want more information, drop me a line. This project raised \$430.

In December they held their 2nd Annual Banquet honoring the "Keeper of the Year", Carl Burch, bird keeper. Congratulations, Carl!

The "Keeper Raffle" raised \$530 this year. Presently they are fixing up their keeper lounge which they want to call "lowlife lounge". They have talked a few artists in the group into doing a mural on the wall. Well, good luck, Florida! Keep it up!



Legislative News

Compiled by Kevin Conway
AAZK Legislative Coordinator

ENDANGERED SPECIES ACT LISTING REVIEW

On 9 February, the National Marine Fisheries Service (NMFS) issued a notice of review in the *Federal Register*. Under the Endangered Species Act, all species must come under a status review every five years to determine if changes need to be made (either uplisting, downlisting, or delisting). NMFS requests data necessary to reclassify any of the species of endangered or threatened species of wildlife listed below:

COMMON NAME	SCIENTIFIC NAME	STATUS
Fishes:		
1) Shortnose Sturgeon	<u>Acipenser brevirostrum</u>	Endangered
2) Totoaba (seatrout or weakfish)	<u>Cynoscion macdonaldi</u>	Endangered
Reptiles:		
3) Green sea turtle (pops. in Florida and Pacific Coast of Mexico)	<u>Chelonia mydas</u>	Endangered
4) Green sea turtle (other populations)	<u>Chelonia mydas</u>	Threatened
5) Hawksbill sea turtle	<u>Eretmochelys imbricata</u>	Endangered
6) Kemp's Ridley sea turtle	<u>Lepidochelys kempii</u>	Endangered
7) Leatherback sea turtle	<u>Dermochelys coriacea</u>	Endangered
8) Loggerhead sea turtle	<u>Caretta caretta</u>	Threatened
9) Olive Ridley sea turtle (pops. off Pacific coast of Mexico)	<u>Lepidochelys olivacea</u>	Endangered
10) Olive Ridley sea turtle (other populations)	<u>Lepidochelys olivacea</u>	Threatened
Mammals:		
11) Caribbean monk seal	<u>Monachus tropicalis</u>	Endangered
12) Hawaiian monk seal	<u>Monachus schauinslandi</u>	Endangered
13) Mediterranean monk seal	<u>Monachus monachus</u>	Endangered
14) Blue whale	<u>Balaenoptera musculus</u>	Endangered
15) Bowhead whale	<u>Balaenoptera mysticetus</u>	Endangered
16) Fin whale (finback whale)	<u>Balaenoptera physalus</u>	Endangered
17) Gray whale	<u>Eschrichtius robustus</u>	Endangered
18) Humpback whale	<u>Megaptera novaeangliae</u>	Endangered
19) Right whale	<u>Balaena glacialis</u>	Endangered
20) Sei whale	<u>Balaenoptera borealis</u>	Endangered
21) Sperm whale	<u>Physeter catadon</u>	Endangered

Comments must be submitted by 31 May 1983 to: Assistant Administrator, National Oceanic and Atmospheric Administration, NMFS, Washington, D.C. 20235.

---AAZPA Newsletter
Vol. XXIV, No. 3, March 1983

REOPENING OF COMMENT PERIOD FOR 5 YEAR NOTICE OF STATUS REVIEW

The US Fish and Wildlife Service (USFWS) has reopened the comment period for the 5-year Status Review on Endangered and Threatened Wildlife and Plants for an additional 90 day period. The Service has received several requests to extend this period in order to provide more data.

Comments must be received on or before 4 May, 1983 in order to insure consideration. Comments may be mailed to the Director (OES) U.S. Fish and Wildlife Service, Washington, D.C. 20240; or to the Regional Director, Region 1, (ARD/FA), USFWS, Suite 1692, Lloyd 500 Bldg., 500 NE Multnomah St., Portland, OR 97232; or to the Regional Director, Region 4, (ARD/FA), USFWS, Richard B. Russell Federal Bldg., 75 Spring Street, SW, Atlanta, GA 30303.

---Federal Register
Vol. 48, No. 24
February 3, 1983

PROPOSAL TO ALLOW PURCHASE, SALE AND BARTER OF CAPTIVE BRED RAPTORS

On 12 January, the USFWS issued proposed regulations to permit raptor propagators and certain other individuals to purchase, sell and barter captive-bred raptors. This would also allow for transfer of eggs, semen and parts. The rule would also amend the Federal falconry standards to allow falconers to purchase, sell or barter captive-bred raptors as well.

Under the Migratory Bird Treaty Act (MBTA), all activities (taking, possession and sale) involving migratory birds are prohibited unless authorized by regulations. Propagation of raptors was authorized in 1972 under the special purpose permit of the MBTA. This new proposal would exempt raptors from the prohibitions of the Endangered Species Act as well.

The proposed action would establish uniform standards for the conduct of raptor propagation activities. For example, a captive-bred raptor would only be eligible for sale if a numbered seamless marker were attached. Raptor propagators would also be required to maintain complete and accurate records of any raptor or raptor egg acquired, possessed, sold, exported or otherwise disposed of together with known ancestral lineage of stock by area of natal origin.

FWS believes this action should alleviate human pressures on wild genetic populations, increase genetic diversity in captive populations and encourage captive production of raptors for recreation, conservation, scientific and breeding purposes.

The AAZPA has submitted comments to FWS requesting that the rule be amended to include a method for commercially operated zoological parks and aquariums to sell and trade captive-bred migratory birds, specifically flamingos and ibis.

---AAZPA Newsletter
Vol. XXIV, No. 3, March 1983

U.S. PROPOSED POSITIONS ON CITES AGENDA ITEMS

On 7 February, the USFWS published a summary of the U.S. proposed negotiating positions for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The following are the positions of interest to AAZPA members:

1) Identification Manual

- ° Support the continued development of an identification manual to be used by port and border enforcement officials. Accurate and expeditious identification of species is essential to successful enforcement of CITES.

2) Standardized Nomenclature

- ° Support the continued work in standardized nomenclature for use in CITES. Problems often occur because there are synonyms for the scientific names of species.

3) Effects of Reservations

- ° A party taking a reservation on the uplisting of a species (from Appendix II-Appendix I) should continue to treat the species as listed on Appendix II.
- ° A party reserving to an uplisting who is trading with a non-reserving party must provide Appendix I documentation for the species.

(Under CITES, a party nation may disagree with a listing and take a reservation. That reserving party is then treated as a non-party with regard to that species. A party member trading with a nonparty must still provide appropriate documentation for the species listing.)

4) Return of Illegally Traded Specimens

- ° Support the proposal to issue CITES documentation to return illegally traded species to the country of export.

5) Time Validity of Export Permits and Re-export Permits

- ° Oppose any attempt to define what is an unreasonably long time between export and import. The U.S. believes such a definition would be arbitrary and not allow the flexibility needed in international shipments. However, the U.S. does not oppose investigation of shipments which take an unreasonably long time to reach their destination.

6) Guidelines for Transport

- ° Support efforts to resolve differences between the CITES Guidelines and the International Air Transport Association (IATA) Live Animal Regulations, provided such resolution is compatible with the humane shipment concerns of CITES.

7) Animals Stressed During Transport

- ° Support the adoption of a suitable short form for reporting undue stress in live animals shipped under CITES permits. The U.S. believes such a form should be completed by a government official concerned with the welfare of the species.

8) Reverse Listing

- ° Oppose any efforts to reverse list. Reverse listing basically treats all species as though they were listed; receiving CITES protection. Species eligible for international trade would have to be exempted from the list. The U.S. believes that species cannot be effectively controlled and managed in the absence of sufficient biological data.

9) International Regulations of Zoos and Similar Institutions

- ° The government of Uruguay has entered a proposal requesting the Secretariat of CITES to establish a "World Registry of Zoos and Similar Institutions." Included in the proposal is a request that CITES have available a system for the evaluation of zoos of the world. Also, the Secretariat is being requested to form a committee responsible for drafting an "International Code of Conduct and Professional Ethics" to help guide the activities of the world's zoos. At this time, the U.S. has not prepared its position on that matter.

---K. Vehrs
AAZPA Newsletter
Volume XXIV, No. 3, March 1983



WILDLIFE PRESERVATION TRUST ANNOUNCES PROFESSIONAL TRAINING PROGRAM

The Wildlife Preservation Trust is offering a four-month internship training program designed for post-graduates and zoo personnel to give them an intensive training in the propagation techniques with a variety of bird, mammal and reptile species. Trainees work in close contact with zoo staff in all phases of animal keeping and breeding. Each trainee spends two weeks in each section and a final two weeks on an independent project. Daily duties are supplemented with weekly seminars on a variety of topics.

Applications may be obtained by writing to the address below. Selection is made in July of each year. Applications should be submitted by June 1st for training beginning in the following year. Starting date is by arrangement. The Training is held at Jersey, Channel Islands, British Isles. Tuition is free. Room and board costs approximately \$65 per week. Trainees are responsible for air fare to and from Jersey. For application and further information write or call:

Training Program
Wildlife Preservation Trust International
34th St. & Girard Ave.
Philadelphia, PA 19104

Telephone: 1-215-222-3636

Great Ape Demonium

HOLIDAY BONUS AT PHILADELPHIA ZOO

By
Patti Kuntzmann, Junior Keeper
Philadelphia Zoo, Philadelphia, PA

December 25, 1982.....

Usually holidays like Christmas and New Years are short days for the keepers at the Philly Zoo. We are required to work only two hours to get a full day's pay. This allows time to do a quick cleaning job and to feed. This particular holiday was a little different.

My boss, Bill Maloney and I had noticed that "Snickers", one of our female gorillas, was very listless. When I locked her into her holding cage to do my cleaning in her unit, I noticed that she came and laid down immediately which was not normal for her to do. Under normal circumstances, she would usually help me close the door and wait for her treats. I started to become suspicious even though her due date was calculated for January 10th. I did my cleaning as quickly as possible and in between I would check on her every 5-10 minutes. I also noticed considerable movement in "Snickers'" large tummy for about an hour.

Finally, between 9:30-9:45 a.m., my suspicions were confirmed when I heard a wimper as I transferred the chimps to another cage. I immediately ran to "Snickers'" to see her cleaning her new baby. I was concerned for the baby's welfare due to the fact that "Snickers" had had a still-born baby some years ago. "Snickers" was a wonderful mother from the beginning. I waited and watched for movement from the frail little gray body. To my joy, the baby appeared very strong, much stronger than our previous baby in 1980. I called Bill and we watched for a little while after I put "Snickers" back into her cage. She also showed off her little baby to everyone that came by to see it. She showed it off to the point that we could see that it was a male. This was a wonderful Christmas present for all at the zoo and one of the best presents I could have ever asked for as her keeper.

A friend of mine came up with the name Rudolph which was in keeping with the Christmas season. But the PR department had other ideas and ran a contest for the name. The winning name was "Justin", as in Just In time for Christmas. Ever since the birth "Snickers" has been able to have contact through the bars with the other gorillas, John, Samantha and Jessie. Jessie had been observed touching Justin through the bars. Christmas holidays this year have been very happy for "Snickers" and for me as her keeper. Once more I was lucky enough to be around when one of our gorilla friends gave birth. I will never forget it. I will never forget the birth of "Justin Rudolph". "Snickers" is a wonderful mother and those who know her expected nothing less!

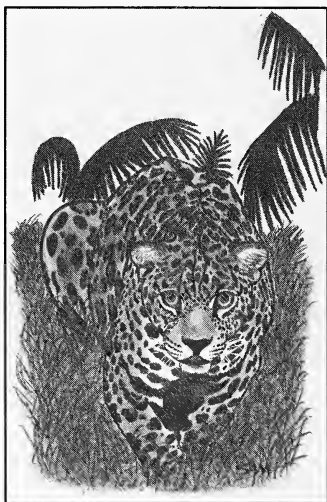


Keeper's Alert

ELEPHANT WORKSHOP PAPERS REQUESTED--The Fourth Annual Elephant Workshop will be held at the Kansas City Zoo in Kansas City, MO, 14-16 October 1983. The format for the Workshop will be informal, but topics must relate to the management and breeding of elephants in captivity. Persons interested in making presentations may send their ideas, abstracts and/or papers to: Elephant Workshop Program Committee, Kansas City Zoo, Swope Park, Kansas City, MO 64132.

Announcing...

New AAZK Publication Available



AAZK is pleased to be able to offer its members and other interested individuals in the zoo community the newly published mammal reference booklet entitled **BIOLOGICAL VALUES FOR SELECTED MAMMALS**. This 55-page work contains biological data on 200 species of mammals. Included in the data are: common name, scientific name, range, gestation, weaning, lifespan, sexual maturity, litter size, estrus cycle, body temperature, and names used for the male, female and young of each species. References for data given are also included.

This informative publication was researched and compiled by a team of zookeepers, docents, interns and zoo volunteers at the San Francisco Zoo. Formatted for quick and easy reference, and charmingly illustrated, this booklet will surely be an important addition to any zoo keeper's library. AAZK has arranged for 50% of the profits, after initial costs are met, to be assigned to the San Francisco Zoological Society, a non-profit support organization of the San Francisco Zoo.

BIOLOGICAL VALUES FOR SELECTED MAMMALS is being offered to AAZK Professional members for only \$1.25. Other membership categories and non-members may purchase the booklet for \$2.50. Prices include postage and handling. To order, fill out the form below or send necessary information to: Biological Values Book, c/o AKF Editorial Offices, 635 Gage Blvd., Topeka, KS 66606. Make check or money order payable to: "Biological Values/AKF".

BIOLOGICAL VALUES ORDER FORM

Please send _____ copies at \$ _____ each to:

Name _____

Address _____ City _____

State _____ Zip _____

Please check membership category: P() AF() AS() INST() NON-MEM()

AAZK Accessories Available

Pins And Charms: Enameled three-quarter inch pins and charms with the official AAZK logo are now available. They are done in the same colors as the AAZK Patch and the charms are suitable for necklaces (you provide the chain). The price per pin or charm is \$3.50 which includes postage. To order send your name, complete mailing address, number of pins or charms desired to: AAZK National, 635 Gage Blvd., Topeka, Ks 66606. Make check or money order payable to AAZK National.

Buttons: For a "Keepers Care" Button, send the coupon and 50¢ to: Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614.



Decals: The official AAZK decal is available through the Memphis Zoo Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.50 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Ave., Memphis, TN 38107.

AAZK T-shirts with the official emblem are now available from the Phoenix Chapter. The price is \$6.75 including postage and handling. Sizes Small, Medium, Large, and Extra-Large are available in two colors: Tan with dark brown logo and Dark Brown with white logo. To order, complete coupon below or copy information and send with check or money order to: Mike Carpenter, 906 N. Hayden, #3, Scottsdale, AZ 85257. Make checks payable to "Phoenix AAZK Chapter". Shirts will be returned by 1st Class mail.

AAZK T-Shirt Order Form

Please send _____ T-shirts at \$6.75 each. COLOR: TAN _____ BROWN _____

SIZE: _____ Small _____ Medium _____ Large _____ Extra-Large

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

Conference.....83

SECOND CALL FOR PAPERS

Papers are requested for the 1983 AAZK National Conference. Suggested topics are: 1) Historical aspects of zoos and zookeeping and 2) Other topics of general interest pertaining to the field of zookeeping. Papers will be limited to 20 minutes with a five minute question/answer period. The registration fee for the conference will be reduced for those people whose papers are accepted. Please submit an outline or abstract by 15 July, 1983. Send papers to: *Bob Berghaier, AAZK Conference, Philadelphia Zoo, 34th St. and Girard Ave., Philadelphia, PA 19104.*

IMPORTANT NOTES

...Please note that the reservation form for the hotel is to be mailed to the Holiday Inn and NOT to the Philadelphia AAZK Chapter. The check for the first night's deposit should be made payable to the University City Holiday Inn and NOT to the Philadelphia AAZK Chapter. The hotel will hold a block of rooms for the conference until 2 September 1983. After this date reservations will be based on availability.

...Please send the conference registration form and check payable to the Philadelphia Zoo Chapter, AAZK to:

*Gene Pfeffer
Conference Registration
Philadelphia Zoo Chapter AAZK
34th St. & Girard Ave.
Philadelphia, PA 19104*

...Please remember to bring an item for the auction which will be held the night of the banquet.

...It would be greatly appreciated if everyone planning on attending the conference would register as early as possible. Besides saving money for late fees, it would make it so much easier on the Conference Planning Committee...Thanks.

TENTATIVE SCHEDULE FOR THE 1983 CONFERENCE

<u>Sunday, October 2nd</u>	<u>Monday, October 3rd</u>	<u>Tuesday, October 4th</u>
Board Meetings	General Session	Day at Philadelphia
Registration	Free Evening	Zoo
Icebreaker--held in	Hospitality Room	Volleyball Game
"Smart Alex" at the		Picnic Lunch
Holiday Inn		Dinner in the Rare
		Mammal House
		Hospitality Room
<u>Wednesday, October 5th</u>	<u>Thursday, October 6th</u>	
General Session	General Session	
Afternoon at Brandywine	Banquet and Auction	
Zoo with dinner provided		
Hospitality Room		

1983 AAZK NATIONAL CONFERENCE REGISTRATION FORM

Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

CONFERENCE REGISTRATION

NAME: _____ AAZK MEMBERSHIP STATUS & FEE:
 ADDRESS: _____ Member or Spouse.....\$50.00
 CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00
 ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
 (After 15 August, 1983)
 PHONE NUMBER: () _____
 ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____

AREA OF INTEREST _____
 WILL YOU BE SUBMITTING A PAPER? _____ YES _____ NO
 (\$15.00 will be refunded from registration fee upon acceptance of paper)
 NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____
 VEGETARIAN? _____ YES _____ NO. If YES, Special Instructions _____

One-Day Rates for individual conference events are available. Contact Gene Pfeffer for details.

TRANSPORTATION _____ (car, plane, etc.)

PLEASE MAKE THIS CHECK PAYABLE TO: "PHILADELPHIA ZOO CHAPTER-AAZK". THE DEADLINE FOR REGISTRATION IS MONDAY, AUGUST 15TH, 1983.

HOTEL RESERVATION REQUEST

University City Holiday Inn, 36th & Chestnut Streets
 Philadelphia, PA 19104

ORGANIZATION: _____

DATES OF CONFERENCE: _____

PLEASE CHECK BELOW THE TYPE OF ROOM YOU WISH TO RESERVE:

_____ SINGLE \$50.00 DAILY (one person)	_____ TWIN/DOUBLE \$56.00 DAILY (two persons)
Room Tax - 6%	\$6.00 charge extra, each person over two in a room

ARRIVAL DATE _____ TIME _____ DEPARTURE DATE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TOTAL NUMBER OF NIGHTS IN HOTEL: _____

SPECIAL REQUEST TO BE MATCHED WITH A ZOOKEEPER ROOMATE: _____

MALE: _____ FEMALE: _____ SPECIAL INSTRUCTIONS: _____

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.



ANIMAL DATA TRANSFER FORM

1. Keeper receiving the animal
2. Zoo file/Veterinarian
3. Keeper sending animal

Date: _____

Common Name _____ Scientific Name _____

Individual Name	Sex	Birth Date*	Weight*	Vendor Specimen # (ISIS #)	Zoo ID	Studbook#
1) _____	_____	_____	_____	_____	_____	_____
2) _____	_____	_____	_____	_____	_____	_____
3) _____	_____	_____	_____	_____	_____	_____

*note if it is actual or estimated

Diet: Present diet and supplements, favored items, problem foods, feeding procedures.

Brief Reproduction Record: Relative data, introduction techniques, behavior toward young, specific concerns.

General Medical History and Physical Conditions: Usual response to medicine, including immobilizing agents and their successful mode of administration, recurring physical problems and symptoms.

Enclosure, Maintenance Data: General exhibit description, cage mates, considerations to avoid abnormal behavior, cleaning and disinfecting procedures.

Personal comments

Present institution _____

Previous institution _____

Future institution _____

Form completed by _____ Title _____

Telephone _____

THE 1983 ANIMAL DATA TRANSFER FORM SURVEY

ATTENTION: All Keepers! Please answer the following questions. (1) Please send this survey right from the AKF or (2) photocopy the survey from the AKF and complete the photocopy or (3) use a piece of paper for your survey. Send completed survey to: Bernie Feldman, Miller Park Zoo, 1020 S. Morris Ave., Bloomington, IL 61701.

- 1) Have you seen or are you familiar with the Animal Data Transfer Form?
- YES NO
- 2) Are you satisfied with the style of the ADTForm?
- YES NO
- 3) Have you used the ADTForm at your Zoo/Aquarium?
- YES NO
- 4) Have you received the ADTForm from other Zoos or Aquaria?
- YES NO
- 5) If you've received the ADTForm, has it been helpful to you?
- YES NO
- 6) When you received the ADTForm, is it properly & completely filled out?
- YES NO
- 7) Are you able to properly fill out the ADTForm?
- YES NO
- 8) Are you aware that ANYONE can make an order for any amount they want?
- YES NO
- 9) Are you aware that the ADTForm is FREE, a professional courtesy of AAZK to anyone?
- YES NO
- 10) Would your zoo/Aquarium pay a nominal fee for use of the ADTForms?
(e.g. \$___/100 ADTForms)
- Yes NO
- 11) Would you recommend the use of the ADTForm for all Zoo/Aquaria?
- YES NO
- 12) If your Zoo/Aquaria doesn't currently use the ADTForm, would your management welcome its use?
- YES NO
- 13) Are you aware that photocopying the ADTForm is discouraged because it has a self-duplicating feature and is intended for Keepers, Veterinarians, and Management?
- YES NO
- 14) Do you like the self-duplicating feature of the ADTForm?
- YES NO
- 15) Are you aware of how to order the ADTForm and whom to contact?
- YES NO
- 16) What changes or suggestions would you recommend on the ADTForm? Please use the space provided for your comments or add additional sheet of paper if necessary.

Comments/Suggestions: _____

THANK YOU FOR YOUR TIME
Bernie Feldman, ADTForm Coordinator

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ASST. CURATOR/BIRDS...responsible for supervision of diverse bird collection and 10 keepers. Knowledge of diets, husbandry, record keeping, ISIS, writing and public speaking required. Two years' supervisory experience in zoological parks prerequisite. Salary \$13,572. Send resume to Bob Seibels, Curator/Birds, Riverbanks Zoological Park, 500 Wildlife Parkway, Columbia, SC 29210.

HERPETOLOGIST/CURATOR...plans and oversees exhibits of reptiles and amphibians; programs and operates computerized exhibits; assists with acquisition/disposition of all animals; develops genetic management/SSP/conservation programs; some administrative duties. Requires BS in Biology or Zoology and experience in care of reptiles. Salary \$22,956-\$27,912. Contact Personnel Department, City of Fresno, 2348 Mariposa Street, Fresno, CA 93721 before 20 April 1983.

ANIMAL CARE SPECIALIST...will be trained for full-time position in animal care techniques for marine mammals, waterfowl and other aquatic birds. Requires high school graduate, strong swimmer, chauffeurs' license and willingness to learn. Competitive salary and benefits. Mail resumes to Attention: Personnel Department, Sea World of Florida, 7007 Sea World Drive, Orlando, FL 32809. EOE.

SENIOR ZOO CURATOR...requires MA in Zoology or related field, 2 years' supervisory experience. Responsible for large, newly constructed, multi-specimen Louisiana Wildlife Exchange. Salary \$20,000. Send resume to David Anderson, General Curator, Audubon Park & Zoological Garden, P.O. Box 4327, New Orleans, LA 70178 (504) 861-2537.

The following job listings were sent directly to the editorial offices of Animal Keepers' Forum for inclusion in this section.

INTERNSHIP...a student internship is available at the Animal Rehabilitation Center within the Conservancy Nature Center located in Naples, FL. The Animal Rehabilitation Center (Project A.R.C.) is a community-supported program, where native injured wildlife are brought in for treatment, and released, if possible, back to their environment. A student internship with this program involves wildlife, as well as educational programs and special projects. Interns must be available for up to five months. Qualifications: a college student or recent graduate, studying wildlife or related field; some experience with people and animals; a sincere concern and interest in working with animals. Housing is provided and interns are given a \$55/week stipend. Internships offered year round. To apply: submit resume, statement of goals and three references to: Julie Wasserman, Supervisor, Animal Rehabilitation Center, Conservancy Nature Center, 1450 Merrihue Dr., Naples, FL 33942. (813) 262-2273.

MAMMAL KEEPER...previous experience with large carnivores desired. Starting salary \$4.05 per hour. Send resume to: Mark D. Pyritz, Curator of Mammals, Riverbanks Zoo, 500 Wildlife Pkwy., Columbia, SC 29210.

**o
p
p
k
o
r
n
o
t
c
u
n
i
t
y**

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo	Work Area	Special Interests
-----	-----------	-------------------

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



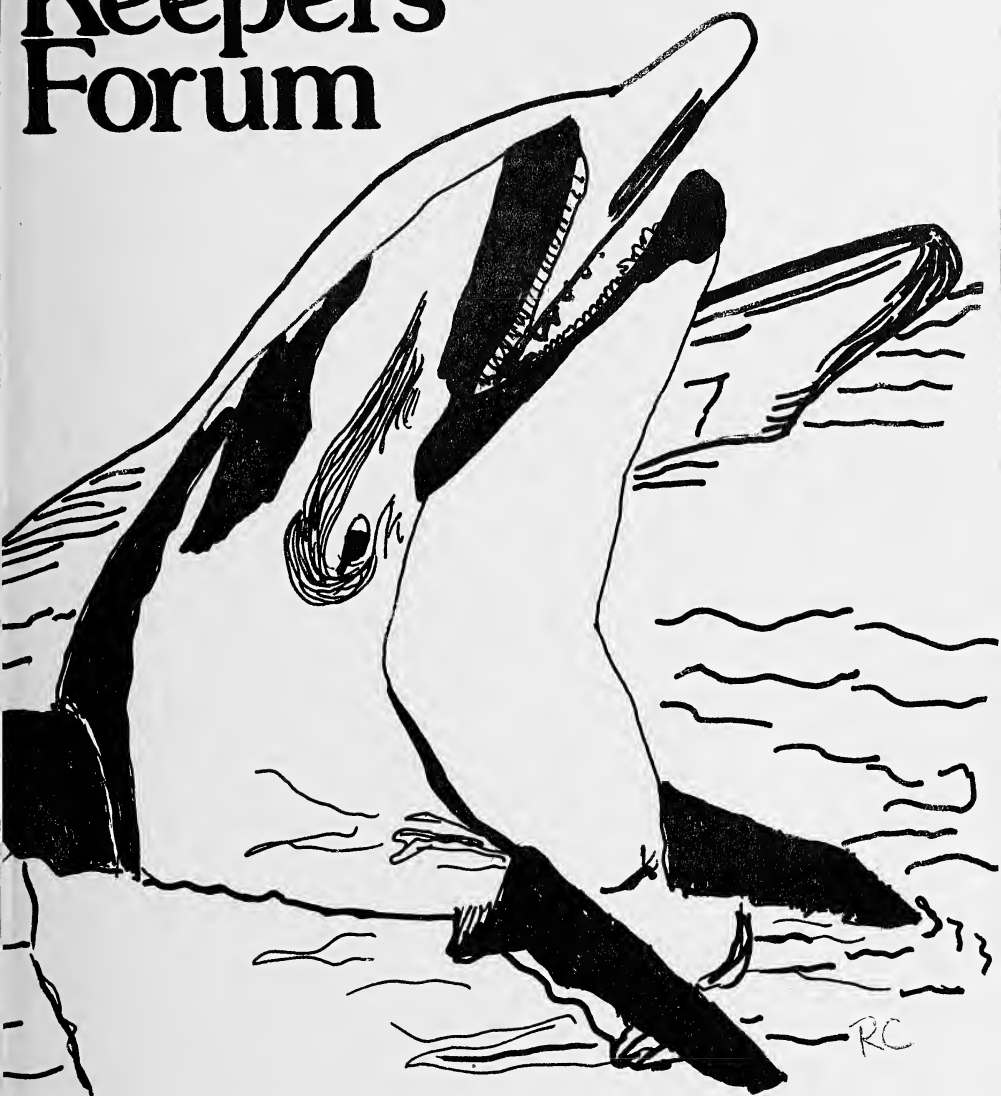
NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

MAY 1983

Animal Keepers' Forum

Smithsonian Institution Libraries



Dedicated to Professional Animal Care

Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
 Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
 Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
 Steve Taylor, Louisville Zoo, Louisville, KY 40213
 Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Audubon Park Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elendra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
<u>Bernie Feldman, Miller Park</u>	<u>Mike Coker, Topeka Zoo</u>
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, *Director*

Ed Roberts	Walter D. Stone Zoo	ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeiffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D.C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Lawrence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, UT, HI
Vacancy		Canada

This month's cover features an ink drawing of a dolphin at Sea World in Florida. The artist is Rebecca Conway, wife of Legislative Coordinator Kevin Conway. Kevin is employed as a Keeper at the NZP Conservation and Research Center at Front Royal, VA. Thanks, Rebecca!

Scoops and Scuttlebutt

FROM OLIVER CLAFFEY, NEW K.A.L. COORDINATOR

I have recently taken over as Coordinator of the Keeper Accomodation List (K.A.L.). The K.A.L. aims at a continent-wide network of contact persons in each Chapter or Zoo, each of whom keeps an updated list of people in their area who will provide accomodations for traveling AAZK members and their families. Our idea is to promote contact among Keepers, fellowship in the AAZK, and Keeper information exchange as well as to provide a way of stretching limited budgets.

As of 1 April, we have 40 contacts in 25 states and 3 Canadian provinces. I would be happy to add any new contact people to the K.A.L. list. The AAZK Keepers' Directory lists Chapters and Zoos who have a K.A.L. contact, which means that people can contact the Chapter directly rather than going through the Metro Toronto Zoo Chapter.

I would be grateful if all contact people could assist me in determining just how much the K.A.L. is being used by letting me know if they were contacted within the last year. Perhaps this could be on an annual basis, enabling me to present a detailed report at the National Conference. Thanks for your time and I'm always open to suggestions as to how we might improve this service.

KEEPER CATEGORY TO AGAIN BE CONSIDERED BY AAZPA

This office was recently notified by President Pat Sammarco that the question of whether to assign zoo keepers a separate category within the AAZPA will again be considered at that group's national meeting in September 1983 in Vancouver.

In a letter to AAZPA Executive Director Robert Wagner, President Sammarco noted that: "Keepers are an intregal part of the team working in Zoos and Aquaria with fellow professionals for the good of our captive wildlife, and our zoological institutions. As in the past, the American Association of Zoo Keepers is requesting that the AAZPA Board of Directors address the proposal that our Professional members and other Zoo Keepers be classified within AAZPA in a Zoo Keeper category, or other appropriate category, which better reflects our status within the zoological family. Zoo Keepers are now grouped with students and interested persons. Zoo Keepers, and our aquarist counterparts have repeatedly shown our active involvement in AAZPA activities. Zoo Keepers are exhibiting professional attitudes and making meaningful contributions to ever improving the care we give to our captive wildlife."

ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession.

The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. Presently any correspondence to the PSC should be broken down as follows:

Kevin Conway
NZP/Conservation & Research Center
Front Royal, VA 22630

MA, NH, VT, RI, ME, NY, PA, DE, CT,
WV, VA, MD, D.C., NC, SC, TN, KY,
GA, AL, MS, LA, and FL.

Craig Moran
Dickerson Park Zoo
3043 North Fort
Springfield, MO 65803

OH, KS, NE, ND, SD, IN, IL, MI, MN, WI,
IA, MO, AR, TX, and OK.

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

WA, OR, CA, AZ, NM, CO, NV, WY, ID
and MT.

from the President

Dear Members,

Congratulations and best wishes are in order for Ed Roberts as he retires from his keeper duties at Walter D. Stone Memorial Zoo. Ed is a past-president of AAZK and has been a member since the Association's beginning. He has been very active in being a Regional Coordinator, author for the Newsletter and Animal Keepers' Forum and as a speaker at national conferences.

Ed is resigning from his RC post, promising that his time will be filled with writing and sharing his experiences with us, through the Forum, and as usual, will see us at the national conference.

I am sure that I speak for us all in wishing Ed a satisfying retirement, and in thanking him for many years as a professional zoo keeper and as an active AAZK member.

---Patricia E. Sammarco
AAZK President
Zoo Keeper



Births & Hatchings

DALLAS ZOO.....Tami Jones

Births and hatchings at the Dallas Zoo for the month of March 1983 were: Mammals - 3.1 Suni, 0.1 Addax, 0.1 Giraffe, 1.0 Dama gazelle, 1.0 Hamadryas (DNS), 0.1 Blackbuck antelope, 1.0.2 Patagonian cavy (DNS), 0.0.4 Patagonian cavy. Birds - 1 Plum-headed parakeet, 2 White-cheeked turaco, 1 White-winged dove, 1 Society finch, and 3 Gouldian finch.

MEMPHIS ZOO AND AQUARIUM.....Robert Evans

The following births and hatchings were recorded during the month of March 1983: Mammals - 2.3 Pygmy goat, 0.0.1 Dusky titi, 0.1 Nilgiri tahr, 1.0 Black lemur, 0.0.4 River otter, 0.0.1 Ring-tail lemur; Birds - 0.0.1 Hartlaub touraco, 0.0.2 Blue-neck tanager, 0.0.3 Green heron, 0.0.2 Bleeding heart dove; Reptiles - 0.0.1 Seychelle Island gecko and 0.0.2 Gold dust day gecko.

TOLEDO ZOOLOGICAL GARDENS.....Michelle Grigore

Births and hatchings at the Toledo Zoo for January to March 1983 include: Mammals - 1.1 American black bear, 0.1 Black leopard (DNS), 1.0 Nile hippo (DNS); Reptiles - 0.0.9 Eastern garters (4 DNS) and 0.0.9 Grey rat snake.

LINCOLN PARK ZOO.....Randy McMahon & Susan Moy

The following are the B&H recorded for March 1983: Birds - 0.0.1 Double-striped thickknee, 0.0.1 Nicobar pigeon, 0.0.1 White-headed buffalo weaver (DNS), 0.0.2 Plush-crested jay, 0.0.1 Silver-beaked tanager (DNS); Mammals - 0.0.4 Red-fronted lemur, 0.0.1 Japanese macaque, 0.0.1 Goeldis marmoset, 0.0.1 Owl monkey, 0.0.1 Snow leopard (stillborn), and 1.0 Bactrian camel.

BROOKFIELD ZOO.....John Stoddard

Births and hatchings for the month of March 1983 include: 0.0.1 Cuban anole, 0.0.2 Australian side-necked turtle, 0.0.1 Hingeback tortoise, 0.0.3 Poison arrow frog; 0.0.1 Roul roul, 0.0.3 Kookaburra; 0.0.1 Rat kangaroo, 0.0.3 White-toothed shrew, 0.0.2 Mongolian jird, 0.0.7 Degu, 0.0.1 Striped grass mouse, 0.0.3 Spotted grass mouse, 0.0.1 Meerkat, 2.6 Domestic hog, 1.1 Collard peccary, 0.0.1 Golden lion tamarin, 0.0.1 Goeldi's marmoset and 0.0.1 Mandrill.

TOPEKA ZOOLOGICAL PARK.....Alice Miser

Births and hatchings for January through April 1983 include: 0.1 Common eland, 0.0.4 Degu, 0.0.5 Rothchild's mynah (3 DNS), 0.0.1 Accouchy, 0.0.1 Scarlett macaw, 1.0 White-handed gibbon, 0.0.4 Giant Indian fruit bat, and 0.0.1 American golden eagle.

Coming Events

ANNUAL MEETING OF THE AMERICAN SOCIETY OF MAMMALOLOGISTS

June 19-23, 1983

Gainesville, FL

To be held at the University of Florida. Interested persons should contact: Jill Sandersen, Division of Continuing Education, 1938 W. University Ave., Gainesville, FL 32603.

In 1984, the American Society of Mammalogists will hold a joint meeting with the Australian Mammal Society in Sydney, Australia. Dates for the meeting are set for 9-13 July 1984. Questions and information concerning the meeting should be directed to: Dr. William Z. Lidicker, Jr., University of California, Berkley, Museum of Vertebrate Zoology, 2593 Life Sciences Bldg., Berkley, CA 94720.

THE 7TH REPTILE SYMPOSIUM ON CAPTIVE PROPAGATION & HUSBANDRY

August 3-6, 1983

Dallas, TX

Call for Papers: All herpetologists are invited to submit for consideration the titles of papers they wish to present. Paper lengths may range from 15 to 40 minutes. A preliminary program will be established by May. A 100-150 word abstract should be submitted prior to 1 May, 1983. Final manuscripts should be submitted by 1 June 1983. Submit all program information to Dr. Peter J. Tolson, Program Coordinator, Toledo Zoological Society, 2700 Broadway, Toledo, OH 43609.

5TH ANNUAL MEETING AMERICAN SOCIETY OF PRIMATOLOGISTS

August 7-10, 1983

Lansing, MI

For registration and further information contact: Dr. David M. Taub, Yemassee Primate Center, P.O. Box 557, Yemassee, SC 29945.

AMERICAN ASSOCIATION OF BOTANICAL GARDENS & ARBORETA AND

AMERICAN ASSOCIATION OF ZOOLOGICAL HORTICULTURISTS
(Joint 1983 Meeting)

September 20-25, 1983

San Diego, CA

Pre- and Post-conference tours are planned for Sept. 20 & 25. Contact person is Jim Gibbons, Horticulturist, San Diego Wild Animal Park, Route 1, Box 725E, Escondido, CA 92025.

AMERICAN ASSOCIATION OF BOTANICAL GARDENS & ARBORETA AND

AMERICAN ASSOCIATION OF ZOOLOGICAL HORTICULTURISTS
(Joint 1983 Meeting)

September 20-25, 1983

San Diego, CA

Pre and Post-conference tours are planned for Sept. 20 & 25. Contact person is Jim Gibbons, Horticulturist, San Diego Wild Animal Park, Route 1, Box 725E, Escondido, CA 92025.

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact Tom Meehan, DVM, Lincoln Park Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.



THE STATE OF THE ASSOCIATION

*Submitted to the members of the American
Association of Zoo Keepers by*

Patricia E. Sammarco, President



As we begin the Association's sixteenth year, we can all be proud of its growth as a professional organization. Our membership now numbers over 1700, with the majority of our members being professional Zoo Keepers in the United States and Canada. Although we are in name the American Association of Zoo Keepers, our membership includes over 140 Keepers throughout the world.

Besides having many international members, AAZK communicates internationally by maintaining contact with our sister Keeper associations in Great Britain, Japan, Australia and is assisting in the formation of associations in Holland and South Africa. International Affairs Coordinator, Randy Adolph of the St. Louis Zoo, maintains contact with Keeper Associations on a worldwide basis.

During 1982, members approved the incorporation of the Association, and that has now been achieved, giving increased legal protection to the Association and its members.

In the last year, eight new chapters have been chartered, bringing the number of active local groups to 27, with eight others in an inactive state. Chapters are becoming more active in national affairs, as well as in sponsoring important programs within their zoos. There is also a trend in the creation of multi-zoo chapters where there are a number of smaller zoos which cannot support individual chapters.

Jill Grade and Mike Coker stepped down from their board positions, with the appointments of Steve Taylor and Connie Cloak to fill these vacancies through December 1983. During this year there will be an election to fill these expiring terms and that of Mike Maybry. Some reorganization of the board is also taking place, giving the board members more experience in administrative duties, overseeing some of the projects and activities previously under direct presidential oversight. With the growth of AAZK in activity as well as in members, this should prove to be a way to maintain the very close contact between members and national level activities.

One of the main goals of the Association has always been to disseminate information important to captive animal care. Members are regularly recognizing and praising the efforts of the ANIMAL KEEPERS' FORUM editors for our fine publication, and our members are to be thanked as well for their contributions of information, articles and artwork. BIOLOGICAL VALUES FOR SELECTED MAMMALS is a book put together by Keepers, Docents, interns and zoo volunteers at the San Francisco Zoo, and given to AAZK for distribution. AAZK projects continue to collect and organize data for publication in notebooks that will expand as more information is contributed. Mike Coker of the Topeka Zoo heads the Gestation Notebook Project; Steve Taylor of Louisville Zoo heads the Infant Development Notebook Project, and the South Florida AAZK Chapter heads the Zoo Diet Notebook Project.

The Animal Data Transfer Form continues to be one of our most successful information exchange projects. With the ADT form, keepers may communicate individual animal care techniques and information as an animal is shipped from one location to another, making the transition as easy as possible for the animal. The form proved itself so well that its use is mandatory

STATE OF THE ASSOCIATION, Continued

at some zoos, and appreciated everywhere. Some minor changes have been made to insure proper routing of the form at the receiving zoos so that the keeper who will care for the animal gets the information as soon as possible.

Thanks to member input, the MEMBERSHIP DIRECTORY increased its value in providing information on our members areas of experience and expertise. The DIRECTORY is also serving as a guide to lodging for traveling Keepers since it notes those participating in the Keepers Accomodations List, as kept by Oliver Claffey and the Metro Toronto AAZK Chapter. There will be a KAL survey of hosts to determine ways to increase KAL awareness and use of the system.

To keep members aware of new and important books dealing with captive animal management and related topics, Ellen Leach of Woodland Park Zoo heads the Book Review Project. Ellen is also working on a Library Resources Project to aid keepers in gathering information.

We all celebrate Judie Steenberg's return to the profession as well as her continuing enthusiasm in Keeper education. With Judie as the committee head, the Continuing Keeper Education Committee is organizing and actively pursuing a collection of zoo education programs for analysis and use in developing a program for AAZK. A video presentation on keeper safety is being developed, and other keeper education projects are in the works, including an exchange program for Keepers and other zoo staff.

Mike Crocker of Dickerson Park Zoo continues to collect and distribute slide shows and other programs developed by members and chapters for the education and entertainment of us all. Mike will review and reimburse appropriate programs which may include conference presentations, zoo tours, animal care techniques and others. These are then rented at a minimal cost to those interested in programs for chapter meetings and other activities.

Because one of our objectives is to present Zoo Keepers as professionals to the public, Karen Starr Wakeland is acting as Executive Producer for the film, LOOKING TO THE FUTURE, which will present us and our profession to the public as part of zoo education programs and possibly through television. The script is being written and locations chosen; filming may begin in 1984 or sooner.

The Career Brochure developed for national use by the Brookfield AAZK Chapter has been well accepted and will add color pictures with the next printing.

With Kevin Conway as head, the Legislative Committee continues to keep members aware of legislative actions and proposals that would affect our profession and conservation issues. Somewhat related to this task is Kevin's chairmanship of the Professional Standards Committee. This has been established to define the responsibilities and requirements of our profession from the Zoo Keeper's point of view, and to establish AAZK as a source of such information. This committee has been established as an informational source and is not intended to be a restricting or legislating body.

One of the most exciting new functions of AAZK is in the awarding of grant funds for Keeper-initiated research projects. The program is new and is limited to four \$250 grants per year, but the funds are being used to improve captive animal care. There are four granting periods each year, with the grant monies available for year-long projects. Recipients must be Professional Members of AAZK but may work with a team of others as appropriate. Frank Kohn of Audubon Park Zoo heads the committee and is available for advice on setting up projects and applying for the grants.

STATE OF THE ASSOCIATION, Continued

AAZK awards now include a Meritorious Achievement Award to recognize contributions to the Association and to the Zoo Keeping profession by individuals, Chapters and other groups. Other AAZK Awards recognize Excellence in Zoo Keeping and outstanding Keeper Education programs. At the Toronto Conference Board meetings, the language of the award procedure was clarified so that it is understood that anyone may nominate a Keeper or group for award consideration.

The Metro Toronto AAZK Chapter is to be complimented for the fine Conference which marked our first Continental and international meeting. We are all looking forward to the next conference in Philadelphia this coming October, and are pleased that the Puget Sound Chapter will be our 1984 hosts.

Our members continue to show their pride in the Association by exhibiting various items sporting the AAZK logo. Patches and enamel pins and charms are available from National Headquarters at the Topeka Zoo. Adhesive stickers come from the Memphis Chapter, T-Shirts are now available from the Phoenix Chapter, and buttons declaring that "Keepers Care" printed around the ecology symbol are available from the Lincoln Park AAZK Chapter.

The American Association of Zoo Keepers is growing steadily in numbers of members and in the enthusiasm that we have for being part of the professional animal care teams in our zoological institutions.



AMERICAN ASSOCIATION OF ZOO KEEPERS INCOME STATEMENT

January 1, 1982 through December 31, 1982

REVENUE:

Memberships	\$24,664.62
Chapters	160.00
Patches	322.00
Animal Keepers' Forum Sales	225.35
Directories	318.00
Buttons	-----
Decals	82.79
Pins/Charms	296.61
Conference Proceedings	97.40
T-Shirts	54.00
Career Brochures	61.39
1982 Conference-Toronto	1,386.39
Misc.	532.72
TOTAL REVENUES	<u>\$28,201.27</u>

OPERATING EXPENSES:

Publications	\$12,357.31
Postage	1,443.41
Postage Meter & Scale	843.68
Office Equip. & Supplies	833.61
Taxes & Wages	6,290.95
Telephone	158.21
Committees (breakdown below)	1,857.60
Copies	46.35
Printing Expenses	694.11
Misc.	607.54
TOTAL EXPENSES	<u>\$25,132.77</u>

AAZK INCOME STATEMENT, Continued

Committees:

Board of Directors (postage)	\$ 97.56
ADT Forms	493.72
Legislation/Conservation	110.20
Film Proposal	563.29
Grants	509.33
R/C System	66.50
Chapter Affairs	14.00
International Affairs	3.00

NET FOR YEAR - GAIN \$ 3,068.50

Cash on hand 1-1-82 \$ 5,740.54

Cash on hand 1-1-83	Checking Acct.	3,456.91
	Savings (Int. in 1982	
	\$142.37)	2,660.65
	Postage in Meter	105.66
	Ctf. of Deposit	1,000.00
	<u>TOTAL</u>	<u>\$ 7,223.22</u>

ASSETS:

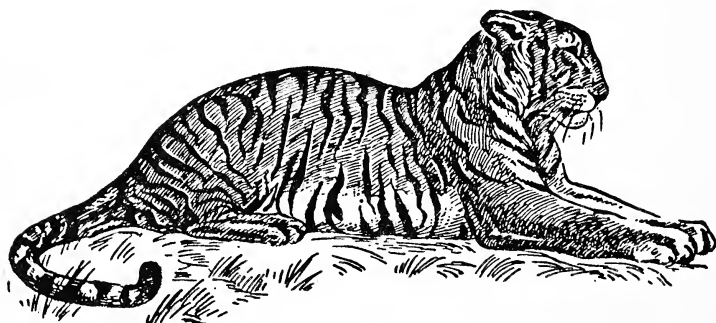
Cash	\$ 7,223.22
Inventory	
Patches	2,120.00
Directories	870.00
Pins/Charms	291.00
Office Supplies	500.00
Office Equipment	50.00

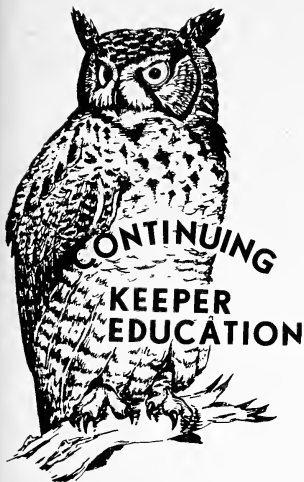
Net Worth 1-1-83 \$11,054.22

1-1-82 12,142.28

Loss in Net Worth \$ 1,088.06

Prepared by Dolly Clark
AAZK Administrative Secretary





CHINA EXCHANGE

By Elandra Aum
Coordinator for Keeper Exchanges

Note: Communications difficulties have resulted in some inaccurate information being disseminated. This article contains the most current data and supersedes information from any other source. Please rely on what is printed here.

There really wasn't enough lead time for everyone to get it together for the working tour exchange in China, so it has been postponed until March 1984 (exact dates to be announced later). Also, the tour has been shortened to 15 days, instead of the 17 previously announced, which lowers the price to \$3100.00. This is a unique opportunity to create your own tour as the Chinese seek to accommodate, as much as possible, the desires of the participants. This includes cultural as well as professional events and places. If you're planning to go and have a special hankering to see a particular place, please submit your suggestions to the author.

China-U.S. Scientific Exchanges, Inc., is the organization on the American side putting together these tours. It is a non-profit organization, whose revenues are used to sponsor American students in China. Its program is endorsed by the U.S. Department of State. I have received a copy of a letter of reference from the American Embassy in Beijing. This letter speaks of the importance of the Corporation in furthering relations between the U.S. and the Peoples Republic of China.

Anyone may apply for this tour. As space is limited to a maximum of 32, it is likely there will be more people wanting to go than there is room to accommodate. Highest priority will be given to AAZK members and to those with high levels of participation in captive wildlife institutions.

There are several requirements for participation:

(1) Four months in advance (Dec. '83) you need to submit the following:

A brief autobiography, emphasizing your education, work experience, publications and papers presented, and contributions in professional or community organizations;

An outline of a topic you could present during your exchange. Five to eight of these will be selected for presentation. Outlines are requested from everyone, however, to assist the translators in preparing for your visit;

A deposit of \$500.00. ALL CHECKS SHOULD BE MADE PAYABLE TO CHINA-U.S. SCIENTIFIC EXCHANGES, INC.

(2) Two months in advance, you will need to submit a valid passport, good for at least 30 days after your scheduled date of return to the U.S.; two completed and signed copies of the "Aliens' Application Form" (the Chinese Visa Application); and two signed, passport-sized (2" x 2") photos. Passports will be returned to you at the port of entry in Beijing.

(3) Forty-five days in advance, the balance of the tour cost (\$2,600.00) must be paid.

CONTINUING KEEPER EDUCATION--China Exchange, Continued

REFUNDS: If you apply and are turned down, your deposit will be fully refunded. If you are accepted and must cancel before the itinerary is approved, \$400.00 of your deposit will be refunded. Cancellation after approval of itinerary will result in loss of deposit; a percentage of the balance is refundable, depending on how far in advance the cancellation occurs. No refunds are possible for cancellations less than ten days before the scheduled departure. If China-U.S. Scientific Exchanges, Inc. cancels for any reason, all monies will be fully refunded.

The tour price includes round-trip air fare to Beijing from the city of departure (Seattle, WA as it now stands), travel, room and board in China, and all events. You will be responsible for getting to and from the city of departure, passport expenses, and personal costs (laundry, souvenirs, etc.)

This is a once-only opportunity to visit China as an "ambassador" for AAZK and professional wildlife specialists from the West. Please address all communications about this tour to: Elandra Aum, Woodland Park Zoological Gardens, 5500 Phinney Avenue N., Seattle, WA 98103.



KEEPER HOT LINE SEEKS VOLUNTEERS

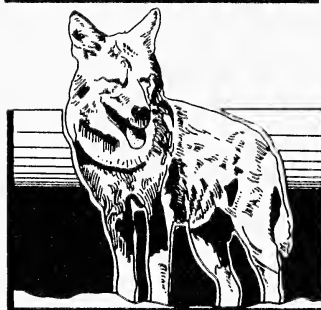
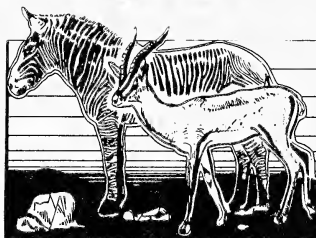
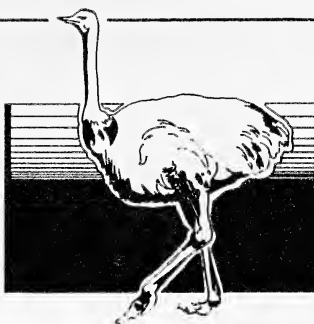
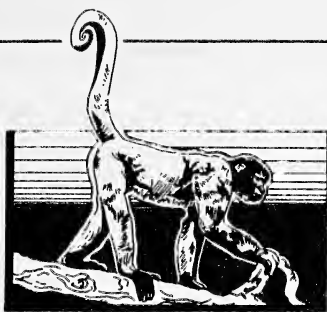
At one time or another all of us have experienced "burn-out" - when internal, external, and personal pressures have caused us to want to "take this job and shove it". In order to help those keepers who really love what they're doing, but occasionally hit the end of their rope, we're attempting to set up a KEEPER HOT LINE. The purpose of this is to give distraught keepers a sympathetic ear to listen. The calling keeper would pay for the call. While it might cost a few dollars, it is a viable alternative to quitting a job you care about.

In order to make the program work, we need volunteers willing to listen to other keepers and share experiences with them. In addition to helping a fellow keeper, volunteers will increase their own horizons by meeting, via telephone, keepers from other parts of the country. Volunteers should have been a Keeper for a minimum of one year. Those wishing to volunteer may contact me:

Mary M. Slaybaugh
1916 Gillespie
San Antonio, TX 78212

Please include your name, address, telephone number and times you'd be available at that number. It is important that we have people available during the day as well as evening hours. In the meantime, if you need a friend, someone to talk to, you can call me at (512) 826-4467 evenings after 5 p.m. or all day Thursday and Friday. Or you may call Jim Higgins at (312) 262-4059 anyday from 6 p.m. until midnight. Or you may call Pat Sammarco - work phone (312) 294-4691 or at (312) 777-7096 until 10PM.





for your
captive
audience

Spectrum offers
a complete line of
High Quality
Food Products,
and we're proud of
the Professional Service
we give our Customers.

Zu/Preem

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

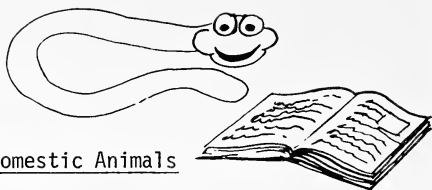
EXCLUSIVELY DISTRIBUTED BY



Animal SPECTRUM Inc.
5801 Locust Street
Lincoln, Nebraska 68516

Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-6492

Book Review



Restraint and Handling of Wild and Domestic Animals

By Murray E. Fowler

Iowa State University Press, Ames, Iowa 50010, 1981.

vi + 332 pp. hardcover. \$27.95.

*Review By John Watson, Jones
Keeper, National Zoological Park*

First published in 1978, this reference book is already in its third printing. Its popularity is well deserved, and every zoo should have a copy.

Dr. Fowler is Professor and Chairman of the Department of Medicine, School of Veterinary Medicine, University of California, Davis; Chief of the Zoological Medicine Service of the teaching hospital there; a past president of the American Association of Zoo Veterinarians; a consultant at major zoos in California; and a visitor to zoos worldwide.

The text and photographs reflect the incredible extent of his own experience as well as ideas and gadgets gained from keepers and other zoo people. He covers subjects like rope work, stress and thermoregulation, and then specific types of domestic and wild animals. There are ample bibliographies, index, and appendices which include sources of drugs and equipment. Well-bound and of large format (8½" x 11"), the book stays open at the page you want.

This well conceived and produced book should help keepers improve their animal husbandry.



Reptile Amphibian potpourri

1982 REPTILE BREEDING RECORDS

By
Ted Daehnke
Sacramento Zoo

(Editor's Note: at the time this article was submitted for publication, Ted was Head Keeper at the California Alligator Farm. He has since moved on to a new position at the Sacramento Zoo)

In 1982 the California Alligator Farm's reptiles produced 179 individuals of 15 species. We felt that a description of our breeding procedures might be of help to others working with similar species. Articles by keepers in other collections about species we have not yet been able to breed would certainly be of use to us.

Our snake houses have fiberglass skylights and are therefore subject to normal daylength for southern California. The only adjustment occurs during the shortest days of the year when the houses are artificially lighted from 8:00 a.m. until 5:30 p.m. We do not intentionally cool the snakes to encourage breeding, but our uninsulated snake houses fluctuate to some extent with the seasons. Winter temperatures at the warmest parts of the tropical houses range from 75°F to 85°F. At the floor of the display cages the temperature runs about 10° colder. The temperate building is allowed to fluctuate

1982 REPTILE BREEDING RECORDS, *Continued*

tuate with local ambient temperatures. The snakes are kept together year round and we have not found it necessary to separate them to encourage breeding. Our adult American Alligators are in outside pens and subject to local temperatures and daylength. Most of our eggs are incubated using the incubator and methods described on page 161 of the July 1982 issue of Animal Keepers' Forum.

The following table lists those species of reptiles born or hatched at the Alligator Farm last year and pertinent breeding information.

SPECIES	Date Eggs Laid	Date Eggs Hatched	#Eggs Laid/ Hatched	Incubation Temperature
False Water Cobra	Feb. 4-5	Apr. 6-16	10/8	86°
Chinese Cobra	Mar. 12	Apr. 28-30	9/5	86°
Chinese Cobra	Apr. 11	May 22-23	7/4	86°
Chinese Cobra	Apr. 28	June 14	9/4	86°
Cascabel	—	May 25	25	—
Three-toed Box Turtle	Apr. 20	June 6	4/2	86°
Banded Cobra	May 4	June 27	29/2*	86°
Corn Snake	May 8-11	July 2-8	10/6	86°
Blacktailed Rattlesnake	—	July 8	1	—
Malayan Moccasin	June 20	July 25-26	19/18	86°
Red-eared Turtle	May 3-16	July 30**	28***	70°-90°****
Malayan Cobra	June 9-12	Aug. 1	13/10	86°
Reticulated Python	May 7	Aug. 3-14	28/11	88°
Grey Rat Snake	July 18	Sept. 1-8	16/9	86°
Gopher Snake	July 24	Sept. 12-13	9/8	86°
American Alligator	July 10	Sept. 18	32/16	86°
American Alligator	July 22	Oct. 6-7	19/4	86°
American Alligator	July 31	Oct. 8	19/9	86°
Haitian Boa	—	Oct. 25	15	—

* Eggs were deposited in temporary storage can and were not discovered until most had spoiled.

**Eggs were all checked on one occasion and had hatched prior to this date.

***Six clutches--No total count available

****Eggs were allowed to incubate at reptile house temperature.



Information Please

LOST OR REMOVED TEETH NEEDED: Needed for treatment research purposes. Please send any lost or removed teeth from any species (particularly elephant molars) appropriately labeled and with resident veterinarian's permission to: Edward V. Shagam, D.D.S., P.A., Zoological Dental Consultant, 127 High Street, Mount Holly, NJ 08060. You will be reimbursed for any postage expenses.

Information is needed on the breeding behavior, sexual differences, cage design, care of young and overall husbandry of Chamaeleonidae species. Contact: John LaMedica, Brandywine Zoo, 1001 North Park Drive, Wilmington, DE 19802.

Anyone having information on the growth rate (weight and measurements) of young Nile hippos, both hand and parent-raised, is asked to write to Patricia Lowery, 307 Augusta St., West Columbia, SC 29169. If available, please include formula used on hand-raised infants. I need information for individuals up to two years of age.

Persons having experience with the Humboldt Woolly Monkey (Lagothrix lagothricha) are asked to contact Marielle Leo, of the Florida State Museum. Information on captive Lagothrix is needed on age, numbers, pelage color patterns, sex, country of origin, date of acquisition, cause of death, growth weight, body size, age on date of first estrus, age on date of first successful copulation, time of teeth eruption, diet and social behavior. Any information at all on Lagothrix biology will be most appreciated. This information will provide valuable data for future field studies of L. lagothricha and will also provide comparative data for current work on L. flavicauda. For further information contact Marielle Leo, FLORIDA STATE MUSEUM, University of Florida, Gainesville, FL 32600.

Anyone having information as to a zoo which might be interested in acquiring a friendly, weaned Yorkshire piglet (Sus scrofa) is urged to write Diane Lord, 70 Cheney Drive, Storrs, CT 06268 or call (203) 429-3990, 24 hours. Ideal for children's zoo. White bristles, blue eyes, prefers zoo life to being a pork chop.

PRIMATE INFOR.! We are interested in obtaining information on birth control techniques in primates. Also, any information or techniques used in forcing females to accept their infants. Send information to: Louise LaRoche, Lafayette Zoological Park, 3500 Granby St., Norfolk, VA 23504.

Persons having experience with the captive breeding of the African Hornbill (Bucorvus leadbeateri) and the Red-bill Hornbill (Tockus erythrorhynchos) are urged to contact the Honolulu Zoo. We are also interested in their diet, growth patterns and diseases. Any information in these areas would be appreciated. Please contact: Richard Ball, Animal Keeper, Honolulu Zoo, 151 Kapahulu Ave., Honolulu, HI 96815.



FOR THE TIME SHE WAS WITH US

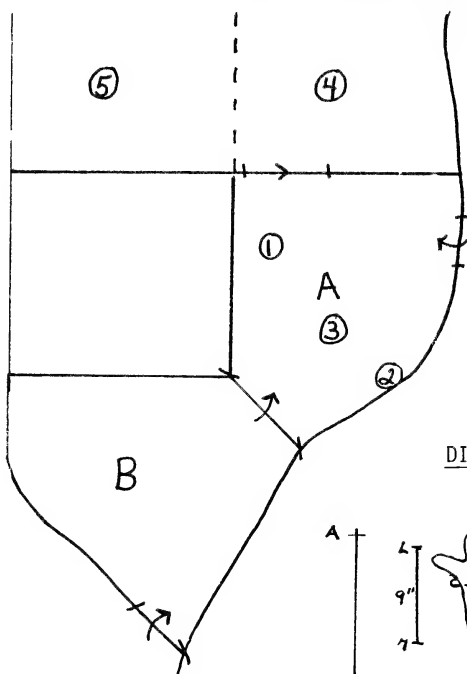
By
Michael E. Lensch, Curator
Chehaw Wild Animal Park, Albany, GA

On 23 December 1982, our Reticulated Giraffe gave birth to a female calf. It was Sugar's first offspring. She had been born at Busch Gardens in Tampa, Florida.

A time table of the birth follows:

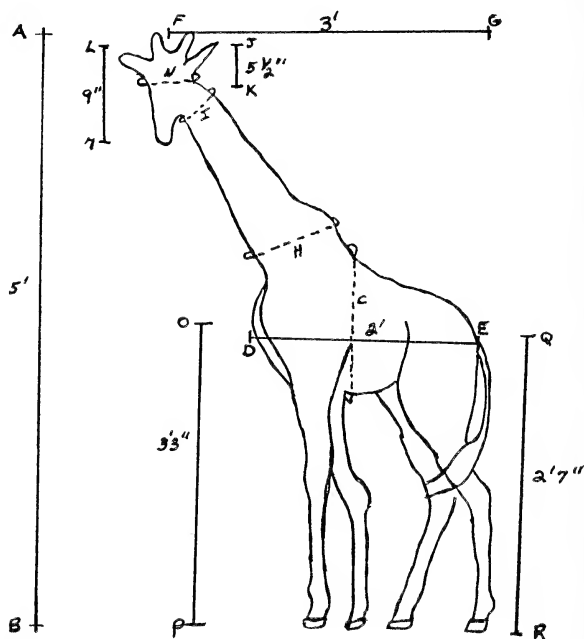
Early October 1981....Sugar was bred
December 23, 1982....Day of the birth
10:15 AM....First observation of labor, one front foot exposed.
Female was let out of the barn with the male, then they were separated due to the male's constant mounting behavior. Female was seen pacing back and forth and visible contractions were taking place.
1:15 PM....The second foot was exposed.
1:20 PM....Birth took place.
1:25 PM....Female curious about offspring, but she was more concerned about cleaning herself.
1:30 PM....Mother placed in barn, offspring was moved to dry area, face was cleaned, it was sexed and Vet checked her respiration.
1:45 PM....Mother was returned from the barn, went right to the baby, and started to clean the calf.
1:54 PM....Mother left calf alone awhile, returned, but was conscious of people being in the area.
1:57 PM....Interest returned towards the calf, the calf showed strength in her legs.
2:02 PM....Again the mother's interest was taken by outside sounds.
2:10 PM....Mother went back to calf, and started to clean her.
2:15 PM....Again the mother left the calf alone.
2:20 PM....Mother returned, started to clean, but then just walked away.
2:22 PM....The calf really tried to stand with the end result being that she fell into the fence.
2:24 PM....Mother was separated into the barn, the calf was moved away from the fence to the center of the pen, the Vet came in and checked her heart and respiration.
2:30 PM....Mother returned to the calf and started to clean her.
2:33 PM....Mother showing interest than no interest in the calf, but still within close range of the calf.
2:40 PM....Calf showing more strength, but when she tries to stand, she drops rapidly with no control of where her head lands. Head tends to hit the ground very hard.
2:45 PM....Calf is up and down trying to stand, seems to be gaining in strength. Mother again showing her off and on behavior towards her calf.
2:48 PM....Mother loses interest in calf again due to outside sounds.
2:52 PM....Mother went back to calf, started to clean plus the calf started to try again to stand.
2:55 PM....Mother lost interest in the calf, but when the Vet went near the fence to check the calf, the mother went right to the calf.
2:59 PM....Mother keeping close eye on the calf; the calf was still trying to stand.

DIAGRAM OF GIRAFFE BARN & HOLDING PENS



- (1) Location of Birth
- (2) Location in fence where baby was caught
- (3) Location where calf was found dead
- (4) Giraffe Barn
- (5) Elephant Barn
- A Birth Location, also location of male during first night
- B Holding pen into which the male was separated

DIAGRAM OF FEMALE BABY GIRAFFE



VITAL STATISTICS

- (1) Height (A to B) = 5 foot
- (2) Girth @ Chest (C) = 2 foot 6 inches
- (3) Length Rear to Chest (D to E) = 2 foot
- (4) Length Rear to Head (F to G) = 3 foot
- (5) Girth @ Neck Lg. (H) = 1 foot
- (6) Girth @ Neck Sm. (I) = 6 inches
- (7) Ear Length (J to K) = 5 1/2 inches
- (8) Length of Head (L to M) = 9 inches
- (9) Girth of Head (N) = 1 foot 5 inches
- (10) Length of front legs (O to P) = 3 foot 3 inches
- (11) Length of back legs (Q to R) = 2 foot 7 inches
- (12) Weight @ Death = 84 1/2 pounds

- 3:04 PM....Mother lost interest
- 3:14 PM....Mother showing interest, but no big deal.
- 3:15 PM....Mother tried to clean her, but then just walked away.
- 3:20 PM....Calf stopped breathing.
- 3:21 PM....Vet and staff rushed in and found she was dead. The cause being that the calf drowned in its own fluid.

After we posted the calf's body, we put the female in the barn and returned the male to the holding pen near the barn. We then placed a wind-break around the pen and positioned a gas space heater to keep him warm throughout the night.

Both were checked at 6:00 a.m. Both the male and female were fine. She had passed all the afterbirth. Through the night she had cleaned herself up and we assisted in completing this task by washing her off.

By 9:30 a.m. the male was moved to the adjacent holding pen and the female was let out of the barn but they remained separated. By 10:45 a.m. both giraffes were led up to the front exhibit (public viewing area) and observations were made all day. There was no aggressive behavior, no male mounting. In fact, both were so relaxed that they both sat down and showed an air of unconcern to the world. At 3:00 p.m. they were both moved back to the holding pens. At 4:00 p.m. they were both put into the barn. No problems occurred then or throughout the night.

Two factors which may or may not have affected the calf's death:

- 1) The length of delivery time from 10:15 a.m. to 1:15 p.m.
- 2) The calf's left leg was positioned over the neck at the time of delivery. This was rectified when the calf was initially cleaned and moved.

Our final conclusions:

- 1) The calf was underweight and small--her weight was 84½ lbs. and her height was only 5 feet.
- 2) Not having the strength to stand, the calf accumulated fluid in her lungs causing the final result.

For myself and my staff, we thank her for the time she gave us.



INFORMATION PLEASE!

Request any information or literature on the Asian small-clawed otter (Aonyx cinerea). Any assistance would be greatly appreciated. Send any information to: Joe Fontanetta, Keeper, Small Mammal House, Lincoln Park Zoological Gardens, 2200 N. Cannon Drive, Chicago, IL 60614.

INFORMATION PLEASE!

RESEARCH ASSISTANCE NEEDED: Request for mites and ticks from reptiles! Preserve in isopropyl alcohol if 70% ethyl alcohol is not available. Please send ectoparasites to: Sue Barnard, Senior Reptile Keeper, Atlanta Zoological Park, 800 Cherokee Ave., SE, Atlanta, GA 30315.

ELEPHANT SET

ELEPHANT "WEIGH-IN" AT SEDGWICK COUNTY ZOO

By

Steve Kingswood, Senior Keeper/African Veldt
Sedgwick County Zoo, Wichita, KS



"How much do they weigh?" This is one of the more frequent questions the veldt keepers are asked concerning the elephants at Sedgwick County Zoo. Now we are able to answer that question with a reasonable degree of accuracy. SCZ currently has 0.2 African elephants (*Loxodonta africana*) that were wild born in 1971 and brought to the zoo in 1972 as part of a shipment by International Animal Exchange. To our knowledge they had never been individually weighed. Thus, we were quite interested in efforts of the elephant keepers at Milwaukee County Zoo to acclimate their elephants to standing on portable scales used for on-the-spot motor carrier inspections.

During the Third Annual Elephant Seminar held at Dickerson Park Zoo, October 8-10, 1982, Roger Martens gave a presentation on the elephant management program in Milwaukee. Upon returning to Wichita after the seminar, we made plans to duplicate their efforts of weighing elephants by having them stand on portable scales. I contacted the Motor Carrier Inspection Bureau of the Kansas Department of Revenue in order to plan the "weigh-in". After getting an idea of what the portable scales were like, we built four wooden stands to approximate the size of the scales. A stand consisted of four 3/4 x 12 inch boards nailed together with over-all dimensions of 3x12x12 inches. The elephants were then accustomed to standing on the wooden stands for the next few months. At first they were reluctant to put even one foot on such a strange object, but it took less than a month before both elephants were putting each and every foot on a stand by themselves.

January 21, 1983 was the big day as a Motor Carrier Inspection Bureau team brought the scales for the "weigh-in". "Arsali" and "Mzuri" proved to be of nearly the same size as they were weighed at 4850 and 4900 lbs. respectively. The procedure was repeated and we received identical readings to confirm their weight. The scales give readings to the nearest 50 pounds and have an accuracy of 99% so we can be reasonably sure of the actual weight.

In addition to being able to answer that frequently asked question, "How much do they weigh?", knowing their weight will allow us to better monitor their health by comparing these figures each year and with those of elephants in other zoos. Medications and tranquilizing drugs can now be more efficiently used by knowing the weight of our elephants.

I would like to acknowledge the assistance provided by the following people at Sedgwick County Zoo in making this operation a success: Ken Redman, General Curator, and Scott Carter, Terry Lincoln and Michelle Thusium, Zookeepers. Special thanks go to Kenith Mathews and the rest of the Motor Carrier Inspection Bureau team for making this all possible.



ZOO News From Japan

A LONG-AWAITED BIRTH OF BLACK WOLVES AT THE OSAKA ZOO

By
Yoshi. Yonetani
ZooDEL/Zoo Design & Education Lab
Kobe, Japan

The second pair of Chinese-Black wolves (Canis lupus chanco) were sent from the Shanghai Zoo, China, to the Osaka municipal Tennoji Zoo through the 4th animal exchange program in October of 1981. Both the male and female were born on 26 March 1980. Fortunately, they had eight cubs on this February 22nd. The gestation period was 59 days following their last copulation. The female had been in heat for five days beginning on 20 December. This was the first breeding in our country and the first delivery for the female.

Of the litter, 4 (3.1) cubs are being hand-raised and the remainder (sex unknown) are being raised by the mother wolf.

The first pair of this species came from the same facility in August of 1974. It was estimated that their age was about five months. However, the male died on 30 January 1979 and the female died on 4 January, 1981 without ever reproducing. At the present time, Japan is the only country keeping Black wolves outside of China.

Also, rare Mongolian gazelles (Procapra gutturosa) which came from the Peking Zoo as part of a friendship present between Japan and the People's Republic of China in September of 1974, are reproducing here as well. The first captive representation of this species outside China was in 1977. (*Reference: the detailed report was published in Vol. 21 of the International Zoo Yearbook.)

Moreover, the Osaka municipal Tennoji Zoo is also well known by the following matter. There are all of four Kiwi (Apteryx australis mantelli) in Japan. It has been about 13 years since the one male arrived on 2 July 1970. And the Zoo received three immature birds newly from Ototohanga in New Zealand on the same date in 1982. It is believed that they are two males and one female. The woman keeper in charge of the Kiwi is famous for enjoying a chorus together with the night crows. We hope for success of their hatching.



Keeper's Alert

CALL FOR PAPERS

The Fourth Annual Elephant Workshop will be held at the Kansas City Zoo in Kansas City, MO, 14-16 October, 1983. The format will be informal, but topics must relate to management and breeding of elephants in captivity. Send your ideas, abstracts and/or papers to: Elephant Workshop Program Committee, Kansas City Zoo, Swope Park, Kansas City, MO 64132.

Legislative News

Compiled by Kevin Conway
Legislative Affairs Coordinator

PROPOSAL TO LIST FOREIGN MAMMALS AS ENDANGERED SPECIES

On 1 March 1983, the FWS published a proposal in the *Federal Register* to list 12 species of foreign mammals as endangered species as provided for in the Endangered Species Act. The decline of the species is believed to be caused by a combination of factors such as habitat destruction, exploitation for use as human food, restricted distribution and specialized habitats

If those species were listed, they would derive some benefits which include: (1) drawing attention to their plight, (2) making U.S. expertise available to assist in conservation efforts, (3) assuring that the U.S. not contribute to the species' decline by providing a commercial market for them, and (4) making U.S. funds available to assist conservation and management efforts.

The purpose of the *Federal Register* notice is to request information on the status and biology of the species. The species under consideration for listing are as follows:

- 1) Rodriguez flying fox fruit bat (*Pteropus rodricensis*)
- 2) Bulmer's flying fox fruit bat (*Aproteles bulmerae*)
- 3) Singapore roundleaf horseshoe bat (*Hipposideros ridleyi*)
- 4) Ghost bat (*Macroderma gigas*)
- 5) Bumblebee bat (*Craseonycteris thonglongyai*)
- 6) Buff-headed marmoset (*Callithrix flaviceps*)
- 7) Preuss's red colobus (*Colobus badius preussi*)
- 8) Vancouver Island marmot (*Marmota vancouverensis*)
- 9) Indus River dolphin (*Platanista indi*)
- 10) African wild dog (*Lycaon pictus*)
- 11) Giant panda (*Ailuropoda melanoleuca*)
- 12) Pakistan sand cat (*Felis margarita scheffeli*)

Anyone wishing to submit comments or receive further information should contact: John L. Spinks, Jr., Chief, Office of the Endangered Species, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240, (703) 235-2771.

---AAZPA Newsletter
April 1983

PROPOSED RULE TO RECLASSIFY NORTH AMERICAN PEREGRINE FALCONS

The FWS published a proposal on 1 March in the *Federal Register* to reclassify the Arctic peregrine falcon (*Falco peregrinus tundrius*) from endangered to threatened and to clarify the status of the American peregrine falcon (*Falco peregrinus anatum*) in some areas of its range. These proposals are a result of the status review that FWS conducts every 5 years on listed species.

The reason for listing the American and the Arctic peregrine falcons on the Endangered Species list was the negative impact of DDT on their survival. With the decline of DDT usage in North America, the peregrine falcon populations of North America are no longer threatened with extinction in the foreseeable future.

LEGISLATIVE NEWS, Continued

The final proposal made by FWS would be to treat all peregrine falcons found in the wild in the continental 48 states which are not of the subspecies anatum or tundrius as endangered under the similarity of appearance provisions. This would be in an effort to protect many of the captive-bred falcons (not readily identifiable as to subspecies or genetic background) which have been released to the wild in Canada and the U.S.

---AAZPA Newsletter
April 1983

NOTES FROM ECOLOGY U.S.A., MARCH 28, 1983

China has disclosed the birth of another panda last August in a zoo in Shanghai. The panda, a female, has received around-the-clock attention in a children's hospital and a first class army ward. It is the first baby panda to survive at the Shanghai zoo in eight births since 1962 and the longest surviving panda reared without its mother. The mother died two weeks after the birth because of a sudden weather change, the official news agency Xinhua said.

The northern elephant seal, nearly exterminated by hunters in the 19th century, has made one of the most remarkable comebacks yet seen, researchers from San Diego State University and the Hubbs/Sea World Research Institute have reported. The seals, which used to breed by the thousands on Pacific coastal islands from Baja California to San Francisco, were reduced by the 1800's to a population of about 100. They had been slaughtered for their oil, but as petroleum products became readily available at the turn of the century, the huge mammals were no longer preyed upon by hunters. Recent population studies have revealed that the elephant seal population has doubled every five years for the last two decades, to 90,000 - 125,000 at present. The researchers, Charles F. Cooper and Brent S. Stewart, noted that crowding on the mammal's relatively confined breeding grounds is a factor that will probably soon stabilize their population.

PROPOSAL TO LIST U.S. BREEDING POPULATION OF WOOD STORK AS ENDANGERED

On 28 February, the FWS published a proposal in the *Federal Register* to list the U.S. breeding population of wood storks (Mycteria americana) as an endangered species. Since 1950, the U.S. breeding population of wood storks is believed to have declined over 75%.

If the wood stork were listed, thereby receiving Section 7 protection under the Endangered Species Act (requiring a FWS consultation with federal agencies whose actions are likely to jeopardize the species), the principle agencies affected would be the U.S. Army Corps of Engineers and the Environmental Protection Agency.

---K. Vehrs in AAZPA Newsletter

Under the above proposal, all woodstork populations residing and breeding east of the Alabama-Mississippi State line would be protected. Breeding of the species in the U.S. is now restricted to Florida, southeastern Georgia, and South Carolina. Formerly, nesting occurred in Texas, Louisiana, Mississippi and Alabama. U.S. breeding populations have declined from over 20,000 in the 1930's to 4,800 in 1980. If this trend continues, the birds are expected to become extirpated as U.S. breeders by the turn of the century.

LEGISLATIVE NEWS, Continued

The wood stork occurs from northern Argentina to the southern U.S. The present U.S. breeding population, which would be protected by the proposed rule, is disjunct from the population which breeds from Mexico to South America. Wood storks from Mexico disperse into the southern U.S. (e.g. California and Texas) after breeding.

Causes of decline

The decline of the wood stork as a U.S. breeding bird is believed to be primarily due to the loss of suitable feeding habitat. This is especially true for the south Florida rookeries where repeated nesting failures have occurred despite protection afforded the rookeries. Feeding areas in south Florida have decreased by about 35% since 1900 due to man's alteration of wetlands.

In addition, man-made levees, canals and floodgates have greatly changed natural water regimes in south Florida. Optimal water regimes for the wood stork involve periods of flooding, during which prey fish populations increase, alternating with drying periods, during which fish are concentrated at high density during the nesting season.

Loss of nesting habitat (primarily cypress swamps) may be affecting wood storks in central Florida where nesting in non-native trees and in man-made impoundments have been occurring recently. Raccoon predation has sometimes been severe at certain central Florida rookeries. Distribution by humans during the nesting season has been observed to cause adult wood storks at some rookeries to abandon their nests, exposing eggs and young birds to predation and the elements.

Critical Habitat Not Proposed

Critical Habitat is presently considered neither prudent nor determinable for the U.S. breeding population of wood stork. Wood stork rookeries and feeding areas change over time and rigidly defined Critical Habitat boundaries describing presently utilized areas may not be adequate for long-term conservation of the species.

The wood stork's feeding area may be separated by large (up to 130 km) distances from its rookeries, and post-breeding dispersal of the U.S. breeding birds extends throughout most of the southeastern U.S. Inclusion of such large areas, even though they may be important to the birds' biology, would be misleading because the stork uses only very limited resources over these large areas. Finally, publication of Critical Habitat maps in the *Federal Register* as required by Section 4(b)(5) of the Act, might increase the chance that wood stork rookeries would be subjected to uncontrolled human disturbance or vandalism.

Effects of the Rule

Under Section 7 of the Act, Federal agencies must insure that any activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species. The principal agency affected by listing the wood stork as Endangered would be the U.S. Army Corps of Engineers, which issues permits for the discharge of dredged or fill materials in U.S. waters under Section 404 of the Clean Water Act of 1977. The Corps also carries out Congressionally authorized water development projects. The listing of this species could also affect future permitting activities by the Environmental Protection Agency (EPA), under Section 402 of the Clean Water Act. No present conflicts with potential EPA permits are known to the Service.

Conservation of the wood stork would allow the species to continue to serve as an ecological indicator of wetland health and to provide pleasure as a natural attraction, particularly in Florida. The wood stork is the only North American breeding stork and is an important attraction at heavily visited natural areas such as Everglades National Park and Corkscrew Swamp Sanctuary in south Florida.

---Endangered Species Technical Bulletin
Vol. V11, No. 3, March 1983





SUMMARY OF EVENTS OF THE 1983 GIANT PANDA BREEDING SEASON AT THE NATIONAL ZOO

The 1983 giant panda breeding season at the National Zoo ended officially 21 March on an optimistic note. After seven years of ineffective mating attempts on the part of the pair, Ling-Ling and Hsing-Hsing copulated for the first time on 18 March, much to the surprise and delight of the Zoo staff. Though both pandas have appeared eager to breed in the past, they have been unable to align themselves in an effective breeding posture. This year's mating not only is the first for the panda pair, but provides encouragement that Ling-Ling might produce an offspring. In addition, the Zoo's medical team artificially inseminated Ling-Ling on 19 March and again on 20 March as a back-up measure.

In the past, breeding attempts by the giant pandas have been both encouraging and disappointing. Ling-Ling has shown signs of a strong heat cycle each spring and sperm tested from Hsing-Hsing, the male, has indicated his capacity to sire offspring. While both pandas have appeared eager to breed during the two to four days when the female's estrus occurs, each attempt has failed. Natural breeding is preferred, but the National Zoo was forced to consider artificial insemination if a panda cub was to be born to this highly endangered species.

In 1980, scientists performed artificial insemination on Ling-Ling but she did not become pregnant. In 1981, Chia-Chia, the male giant panda from the London Zoo, was flown to Washington in the hope that his encounter with Ling-Ling would be more successful. The pair proved incompatible during one breeding encounter, and Ling-Ling's heat cycle ended before artificial insemination could be performed. In preparation for the 1982 spring estrus, Ling-Ling and Hsing-Hsing were put together on several mornings each week so that they might become more familiar with each other and hopefully increase the chances of breeding. But after three days of unsuccessful mating attempts during the 1982 estrus, a medical team was readied to undertake the precise medical procedures to artificially inseminate Ling-Ling. For the first time an optical instrument called a laproscope was used on a panda in heat. Ling-Ling's ovaries were examined and the medical team confirmed that ovulation occurred close to the time when the inseminations were made. Despite the optimism resulting from this finding, and subsequent hormonal and behavioral changes indicative of pregnancy in the following months, Ling-Ling did not give birth in 1982.

This year, the giant pandas were again put together on several mornings each week in preparation for breeding season. Ling-Ling showed the first signs of heat, including increased scent-marking and vocalizations, on 16 March. The pair showed great interest in each other when they were put together on the morning of 17 March, but less interest in their evening encounter that day. On 18 March, their attraction to one another intensified again and finally resulted in a natural mating.

After seven years of unsuccessful mating attempts, the Zoo staff was pleased and gratified with this new development and postponed plans for artificial insemination hoping that the pandas would breed naturally again. Later that day, however, when the pair was put together, their encounter was mainly one of aggression and avoidance. Hsing-Hsing was noticeably more assertive than had ever been observed before. Copulation did not take place. Mating attempts between the two ended in disappointment again on the morning of 19 March. By mid-afternoon the pair were separated and final preparations were made for artificial insemination.

SUMMARY OF GIANT PANDA BREEDING SEASON AT NZP, *Continued*

The medical procedure was performed on Ling-Ling by a team of National Zoo veterinary, research and keeper staff with the aid of assisting professionals from other institutions. Semen from Chia-Chia, which had been hand-carried from the London Zoo by two of their scientists, was introduced to an anesthetized Ling-Ling on 19 March. After another unsuccessful attempt at securing a natural mating on 20 March, a second insemination procedure was performed. On 21 March, the pandas showed little interest in each other and Zoo scientists determined that Ling-Ling's heat cycle had ended.

Giant pandas breed for only a short period of time each year, from two to four days, when the female comes into heat. This year's breeding season at NZP was unique not only because the pandas finally mated, but because Ling-Ling stood for the male and held "lordosis" (breeding position) more than in previous years. In addition, Hsing-Hsing's behavior was noticeably more assertive. Zoo scientists have speculated that the heat period was foreshortened this year due to the natural mating.

It will not be known for certain whether Ling-Ling is pregnant until she gives birth or passes the known panda gestation period, but urine samples will be taken and her hormone levels will be checked regularly in the upcoming months. The gestation period for a panda is reported to vary between 122 and 163 days. If Ling-Ling is pregnant, a birth could occur sometime between mid-July and early September.

*Excerpted from National Zoological
Park press release of 21 March 1983*



Publications Available

Complete Guide to Snakes of Florida by William E. Haast, Director Miami Serpenterium and Robert Anderson. A complete, descriptive, well-illustrated book that introduces and identifies all snakes, poisonous and nonpoisonous species that have been recorded in Florida. Includes information on habit and habitat, caution in the field, medically-approved snake bite treatment, up-to-date taxonomy of all the species, interesting facts about snakes, measurements of all snakes in metric and standard systems. Contains 37 color photographs and 17 black/white line drawings. The price is \$8.95 plus \$1.50 postage and handling for the first book ordered and \$1.00 per each additional book. Order from The Phoenix Publishing Co., P.O. Box 430733, Miami, FL 33143. Please include payment with order. Foreign orders in U.S. currency only.

Two brochures: "Help for Hooked Birds" and "The Care and Feeding of Orphan Song and Garden Birds" are available from the Suncoast Seabird Sanctuary. They are geared to the general public and Florida natives in particular. Funds for the operation of the Suncoast Seabird Sanctuary come solely from donations. Most of these funds come from individuals who have joined either their membership or adopt-a-bird programs. The Sanctuary, which is open free to the public, cares for and rehabilitates injured birds and seafowl. For information write: Suncoast Seabird Sanctuary, 18328 Gulf Blvd., Indian Shores, FL 33535.



Research.....

A GUIDE TO GETTING STARTED IN RESEARCH

By
Ken Kaemmerer, Keeper
Dallas Zoo, Dallas, TX

Some people, in watching "researchers" at work, will think, "I wish I could be doing that." However, they discourage themselves from trying anything believing that they haven't had the education or experience to perform research. Research begins by attempting to answer the questions "How", "Where", "When", or "Why"? The only criteria one needs to begin answering these questions is inner motivation. However, a motivated, but inexperienced person, may still wonder--"But where do I start?" I originally wrote this guide to help some bewildered fellow keepers at the Dallas Zoo get started, but I believe there may be others who might benefit also; so I offer this guide for those interested in pursuing research.

I. You have an idea, a question, and/or problem. Write it down to help you formulate it.

II. Seek information on the subject.

a) Ask people--keepers, curators, veterinarians, graduate students, professors.

b) GO TO THE LIBRARY.

1) Where?

aa) Local Zoo Library

bb) Friends' and associates' personal libraries

cc) University, college or public libraries.

2) How? Where does one start?

aa) Zoological Record

aa1) Look under animal's Latin name for subjects of interest and authors who have written something on the subject. Then look up the particular article titles and journals.

aa2) Look under particular subject headings, e.g. behavior--territorial--marking

bb) Biological Abstracts--gives abstract of each paper listed in it (procedure similar to Zoological Record).

cc) Bioresearch Index (procedure similar to Zoological Record)

dd) Science Citation Index--you know an author has published something on your subject of interest. You can find what other authors have referred to this author in their articles and thereby find other articles related to your interests.

ee) General and specific books.

c) Write people at other zoos or universities for information.

III. Review: Sift through information you have collected to identify what is known and what is not known on the subject.

A GUIDE TO GETTING STARTED IN RESEARCH, Continued

IV. Write a proposal (See Dallas Zoo Research Form)

- a) Identify question.
- b) Materials and animals needed (are they available?).
- c) Procedures.
 - 1) Methods of study (will they interfere with animal health or zoo routine?).
 - 2) Methods of analysis.
- d) Amount of time needed.
- e) Optional--give proposal first to co-workers/friends who are familiar with research for their comments and suggestions.

V. Give proposal to Supervisor, Curator, and Director.

VI. Do research (pace yourself).

VII. Analyze results.

- a) What happened?
- b) Would statistical analysis help?

VIII. Write up results and discussion.

IX. To publish or not to publish.

- a) If so, where?
 - 1) Animal Keepers' Forum
 - 2) International Zoo News (London)
 - 3) International Zoo Yearbook
 - 4) Technical journals
 - 5) Zoo's or Society's local newsletter or magazine
- b) How?
 - 1) Each journal/magazine has instructions to follow in writing and submitting an article.
 - 2) Have some people familiar with the subject review your article before submitting it.
 - 3) Send to journal/magazine of choice for review.
 - aa) It is accepted
 - aa₁) It will be published as is.
 - 1) There may or may not be page charges.
 - 2) There may or may not be charge for reprints.
 - bb₁) It is accepted conditionally--needs rewriting.
 - bb) It is rejected
 1. Examine criticisms.
 2. Rewrite and submit elsewhere.
 3. PRESERVE: Don't give up.
- c) It is published; congratulate yourself; CELEBRATE!!

A GUIDE TO GETTING STARTED IN RESEARCH, Continued

RESEARCH PROJECT PROPOSAL FORM USED AT THE DALLAS ZOO

Name(s) of keeper(s):

Animals involved:

Brief description of project:

Materials involved:

Non-zoo resources required, if any:

How long do you expect this project will take?

Do you plan to publish your findings and if so, where?

How will this project benefit the zoo industry in general and the Dallas Zoo in particular?

Date submitted to Supervisors:

Approved by Supervisor: _____
(signature) (date)

Date submitted to Curator:

Approved by Curator: _____
(signature) (date)



BEAR RESEARCH CONFERENCE HELD

The 6th International Conference on Bear Research and Management was held at the Grand Canyon, AZ on 18-22 February 1983. Over 50 papers were presented concerning most bear species both in the wild and captivity. Many keepers and other interested persons from zoos around the nation attended and benefited from the information exchange with over 200 field bear biologists. Zoos attending the conference were: Washington Park Zoo, Portland, OR; Baltimore Zoo, Baltimore, MD; San Diego Zoo, San Diego, CA; National Zoo, Washington, D.C.; San Francisco Zoo, San Francisco, CA; and the New York Zoological Society.

Three papers were presented by zoo personnel: "Development of Captive-born Maternally Reared Sloth Bear Cubs", by Dan C. Heath and Jill D. Mellen (Washington Park Zoo); "Comparative Maternal Behavior of Spectacled Bear and Sloth Bear" by Morna Holden (National Zoo); and "Group Formation Studies in Captive Brown Bears: Sociological Implications" by F. Colmenares, Departamento de Investigacion, Spain. In addition, George Schaller, NYZS, presented a lecture and film on the Giant Panda and Bernie Peyton, NYZS, presented a poster session on the Spectacled bear.

POLICY IS THE BEST POLICY

By

Jeanne Grossmayer, Head Keeper
Akron Zoological Park, Akron, OH

Every place of employment has its own set of "policies". Some of these policies are rather general (meaning you can "bend" them), others are quite specific (meaning you can try to "bend" them). From a recent incident, I personally found that there is reason they be followed (I know, I know, but I mean it, it's true).

It was the week of Christmas when I received the call from a lady who said she had an injured bird she wished to bring in to the zoo. Now, normally we discouraged the public from bringing injured animals to us, instead giving them instructions on treating it themselves, or when it involves more serious injuries, referring them to a veterinarian. But it was Christmas, it sounded like a mild wing injury, and besides, she had twenty pounds of bird seed to go with it. So I told her yes.

When she arrived, the bird in question turned out to be a pigeon (Oh, great) and from what I could see, both wings as well as the rest of the bird, was in pretty good shape. Now our policy in this matter generally dictates that we have the person fill out a donation form and not make any decisions on the animal until after the party has left. This is mainly because the possibility that the animal will have to be euthanized is sometimes involved. But the bird really appeared to be fine so I suggested we step outside and I'd try releasing it, assuring the lady that if indeed it could not fly, we'd nurse it until it could. (Oh, I meant so well, really I did).

Cradling the bird in both hands, we stepped out the front door. I opened my hands giving the bird a little boost at the same time and it flapped twice before falling like a literal rock (dove?) to the ground. OK, but knowing that birds tend to stress out from all the unwanted contact, I suggested we try again. This time with another little boost from me, the bird went flapping off quite comfortably towards a nearby tree. I turned to the lady and said, "See, it is going to do just fine." As I turned my attention back to the pigeon, I, along with the lady and a nearby maintenance man, watched as a wild red tail hawk swept down out of nowhere and nailed the pigeon in mid-flight! (Wow, what a kill!) Which unfortunately is what I said outloud, forgetting myself in the excitement of witnessing a live kill for the first time.

The lady grew very red in the face and said, "Well, if I had known you were going to do that to it, I would never have brought it in."

I tried to explain that there was no way I could know this would happen, that it was a wild hawk (keep talking) and she of course (somehow I sensed this would be her attitude) went on about how we should shoot the hawk. I replied that we just didn't do things like that (especially over a pigeon, although I prudently left that comment out).

As she got in her car to go, with me still apologizing, the maintenance man who had witnessed the incident attempted in his way to smooth things over. He opened her car door for her and said brightly, "Well, thanks for bringing it in, ma'am. Merry Christmas."

At that point, I could hardly contain myself and had to hurry into the building for fear of bursting into laughter she could not be expected to understand. It wasn't really funny, but it was absurd, ironic, disastrous and so tense a situation that laughter was the only release.

Hey, I learned though, boy, it is policy, almost all the time now.



THINK Safety!

By Jill Grade, Aves Keeper, Busch Gardens, Tampa, FL

One of the most profitable seminars held at the Toronto Conference was the Safety Workshop chaired by Wayne Buchanan. Safety seems to be an area of our working lives that we all care about, but rarely do anything to improve--we just don't think about it...until it's too late.

Wayne has included many common sense animal care safety techniques in his article on pages 337-339 of the 1982 AKF Conference Proceedings. He also points out that a large percentage of on-the-job accidents result from our own thoughtlessness--- "No safety system will be effective unless you accept the primary responsibility for your own safety."

In a busy workday, however, safety is often the last thing on our minds. We may note a few obvious conditions and compensate for them; but, on the whole, we do not consciously think safety. I feel that this is due mainly to lack of practice. We often deal with safety on a subconscious level, but do not actively practice safety thinking.

I propose to include a column on safety in every issue of AKF. The purpose of this column will be to share our insights on safety technique, and, above all, to keep safety ever-present in our thoughts---with a little practice, I feel we will all be able to think safety automatically, without crowding out other thoughts on animal care.

Though I can coordinate input, this column will not exist without your contributions. Please begin sending anything that crosses your mind on health and safety in your zoos, whether directly related to animal care or not. There will be no strict format, so anything from cartoons, anecdotes, and tips to articles will be appropriate. Contributions may be sent anonymously. Let's begin to take a long, hard look at zoo safety, from a management point of view as well as the keeper's.

Safety is not only a moral necessity, but a practical one. Practices which do not promote the preservation of "one's own life and health," as well as that of the animals in our care, are unnecessary and wasteful. Accidents are expensive for the institutions at which we work, as well as for ourselves. Accidents can be prevented, if we all simply care enough about safety to put a little effort into promoting it.



PYTHON DATA REQUESTED: The Institute for Herpetological Research, in conjunction with the Reptile Breeding Foundation, is soliciting data for the revised and expanded edition of the Python Breeding Manual. The new edition will include data on all genera of Boidae. Information on breeding of *Epicrates* should be sent to Thomas Huff, Reptile Breeding Foundation, P.O. Box 1450, Picton, Ontario K0K 2T0, Canada. Data on other genera should be sent to Richard Ross, M.D., Institute for Herpetological Research, P.O. Box 2227, Stanford, CA 94305.

Conference.....83

SECOND CALL FOR PAPERS

Papers are requested for the 1983 AAZK National Conference. Suggested topics are: 1) Historical aspects of zoos and zookeeping and 2) Other topics of general interest pertaining to the field of zookeeping. Papers will be limited to 20 minutes with a five minute question/answer period. The registration fee for the conference will be reduced for those people whose papers are accepted. Please submit an outline or abstract by 15 July, 1983. Send papers to: Bob Berghaier, AAZK Conference, Philadelphia Zoo, 34th St. and Girard Ave., Philadelphia, PA 19104.

IMPORTANT NOTES

...Please note that the reservation form for the hotel is to be mailed to the Holiday Inn and NOT to the Philadelphia AAZK Chapter. The check for the first night's deposit should be made payable to the University City Holiday Inn and NOT to the Philadelphia AAZK Chapter. The hotel will hold a block of rooms for the conference until 2 September 1983. After this date reservations will be based on availability.

...Please send the conference registration form and check payable to the Philadelphia Zoo Chapter, AAZK to:

Gene Pfeiffer
Conference Registration
Philadelphia Zoo Chapter AAZK
34th St. & Girard Ave.
Philadelphia, PA 19104

...Please remember to bring an item for the auction which will be held the night of the banquet.

...It would be greatly appreciated if everyone planning on attending the conference would register as early as possible. Besides saving money for late fees, it would make it so much easier on the Conference Planning Committee...Thanks.

TENTATIVE SCHEDULE FOR THE 1983 CONFERENCE

Sunday, October 2nd

Board Meetings
Registration
Icebreaker--held in
"Smart Alex" at the
Holiday Inn

Monday, October 3rd

General Session
Free Evening
Hospitality Room

Tuesday, October 4th

Day at Philadelphia
Zoo
Volleyball Game
Picnic Lunch
Dinner in the Rare
Mammal House
Hospitality Room

Wednesday, October 5th

General Session
Afternoon at Brandywine
Zoo with dinner provided
Hospitality Room

Thursday, October 6th

General Session
Banquet and Auction

1983 AAZK NATIONAL CONFERENCE REGISTRATION FORM

Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

CONFERENCE REGISTRATION

NAME: _____ AAZK MEMBERSHIP STATUS & FEE:
ADDRESS: _____ Member or Spouse.....\$50.00
CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00
ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
(After 15 August, 1983)
PHONE NUMBER: () _____
ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____
AREA OF INTEREST _____
WILL YOU BE SUBMITTING A PAPER? ☐ YES ☐ NO
(\$15.00 will be refunded from registration fee upon acceptance of paper)
NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____
VEGETARIAN? ☐ YES ☐ NO. If YES, Special Instructions _____

One-Day Rates for individual conference events are available. Contact Gene Pfeffer for details.

TRANSPORTATION _____ (car, plane, etc.)

PLEASE MAKE THIS CHECK PAYABLE TO: "PHILADELPHIA ZOO CHAPTER-AAZK". THE DEADLINE FOR REGISTRATION IS MONDAY, AUGUST 15TH, 1983.

HOTEL RESERVATION REQUEST

University City Holiday Inn, 36th & Chestnut Streets
Philadelphia, PA 19104

ORGANIZATION: _____

DATES OF CONFERENCE: _____

PLEASE CHECK BELOW THE TYPE OF ROOM YOU WISH TO RESERVE:

<input type="checkbox"/> SINGLE \$50.00 DAILY (one person)	<input type="checkbox"/> TWIN/DOUBLE \$56.00 DAILY (two persons)
Room Tax - 6%	\$6.00 charge extra, each person over two in a room

ARRIVAL DATE _____ TIME _____ DEPARTURE DATE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TOTAL NUMBER OF NIGHTS IN HOTEL: _____

SPECIAL REQUEST TO BE MATCHED WITH A ZOOKEEPER ROOMATE: _____

MALE: _____ FEMALE: _____ SPECIAL INSTRUCTIONS: _____

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

MAMMAL KEEPER...responsible for care, feeding and handling including breeding projects, exhibit renovations and maintenance of animal enclosures and adjacent grounds. Experience required and degree in Animal Science or related field desired. Starting salary is \$6.92 an hour plus benefits. Send resume to Glenous M. Favata, Curator of Mammals, Toledo Zoological Gardens, 2700 Boardway, Toledo, OH 43609 by 31 May 1983.

SENIOR ZOOKEEPER...responsible for operation of Zoo, including health and maintenance of animals, supervision of zookeepers and repair and maintenance. Experience in breeding, dietary requirements and general husbandry desired. Requires two years' zoo experience and college courses in related fields or additional supervisory experience. Salary \$18,012 - \$22,505, plus benefits. Send resume/salary requirements to Norma Morgan, Personnel Department, City of Clovis, P.O. Box 760, Clovis, NM 88101. Closing date 31 May 1983. EOE.

VETERINARIAN...prefer a progressive veterinarian experienced in exotic animal practice, with desire to practice all phases of veterinary medicine. Well-equipped clinic available. Salary commensurate with experience and qualifications. Contact Don Farst, DVM, Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520. (512) 546-7187.

INTERNSHIP...a student internship is available at the Animal Rehabilitation Center within the Conservancy Nature Center located in Naples, FL. The Animal Rehabilitation Center (Project A.R.C.) is a community-supported program where native injured wildlife are brought in for treatment, and released, if possible, back to their environment. A student internship with this program involves wildlife, as well as educational programs and special projects. Interns must be available for up to five months. Qualifications: a college student or recent graduate, studying wildlife or related field; some experience with people and animals; a sincere concern and interest in working with animals. Housing is provided and interns are given a \$55/week stipend. Internships offered year round. To apply: submit resume, statement of goals and three references to: Julie Wasserman, Supervisor, Animal Rehabilitation Center, Conservancy Nature Center, 1450 Merrihue Dr., Naples, FL 33924. (813) 262-2273.

ZOOmobile COORDINATOR...Audubon Park Zoo is now taking applications for the position of ZOOmobile Coordinator. Responsibilities include administrative, educational and volunteer aspects of the program. The ZOOmobile is a mobile unit designed to take live animals to mentally and physically handicapped groups such as special education classes, hospitals and old age homes. Education and/or animal experience preferred. Send resume and salary requirements to: Audubon Park Zoo, Dept. of Education, P.O. Box 4327, New Orleans, LA 70178.

o
p
p
o
r
t
u
n
i
t
y
k
n
o
c
k
s



AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

Animal Keepers' Forum

*Published by the American Association of
Animal Care*



Dedicated to Professional Animal Care

JUNE 1983

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Alice Miser
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 President
Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
Steve Taylor, Louisville Zoo, Louisville, KY 40213
Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Turtle Back Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
<u>Bernie Feldman, Miller Park</u>	<u>Mike Coker, Topeka Zoo</u>
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Vacancy		ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeiffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D.C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Laurence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's artist is Rose Palazzo, an Associate member of AAZK and the switchboard operator at the Bronx Zoo. Rose's artwork features a North American raccoon peering inquisitively from his treetop perch. Thank, Rose!

Scoops and Scuttlebutt

AAZK BOARD APPROVES NEW PSC MEMBER

The Board has approved the selection of Steven M. Wing of the Milwaukee County Zoo as a member of the Professional Standards Committee. Steven will be collecting data for the Committee from Alaska, Hawaii and the Canadian provinces.

Craig Moran, formerly listed on the Professional Standards Committee Survey Notice, has resigned from his position at Dickerson Park Zoo and is therefore ineligible under the AAZK by-laws to remain on the Committee. Until Craig is again affiliated with a zoo professionally, his areas of data collection for the survey will be handled by Steven M. Wing. Please see survey notice on page 171 of this issue. We all thank Craig for his assistance in the Committee's work thus far and wish him the best of luck in his future endeavors.

JUNE DECLARED NATIONAL ZOO AND AQUARIUM MONTH

President Ronald Reagan has officially declared June as National Zoo and Aquarium month for 1983. In his proclamation, the President stated that "As the living classroom for some 20 million school children each year, Zoos and Aquariums have an important role in the American educational process. They also provide stimulating recreational experiences for more than 125 million people who visit them annually. The United States has some of the finest zoo and aquarium facilities in the world. Many are foremost in the effort to conserve the species they house. American zoos and aquariums cooperate with institutions around the globe to preserve wildlife and to create sophisticated techniques for exhibiting animals in natural settings. To both children and adults, animals represent a special sense of curiosity, feeling and caring. By enabling us to observe animals firsthand and to learn about their habitats, zoos and aquariums have become a valuable and unique asset."

HAVE A TOOTHY PROBLEM? All members are reminded that Dr. Edward Shagam, zoological dental consultant from New Jersey, is more than willing to answer your questions concerning dental problems, questions on routine care, etc. in his column "Tooth Talk" in AKF. Please submit your questions and/or problems to Dr. Shagam at 127 High Street, Mount Holly, NJ 08060.

Births & Hatchings

BRONX ZOO.....Margaret Price

Births and hatchings at the Bronx Zoo for the month of March 1983 include: Birds - 2 Malayan peacock pheasant, 1 Mauritius pink pigeon, 1 Red and white rail, 1 Inca tern, 1 Crested quail dove, 4 Lilac breasted roller, 7 Rothchild's mynah, 1 Congo peacock and 1 Silver gull; Mammals - 2.1.5 Mouflon, 0.0.2 Saddleback tamarin, 4.0 Degu, 1.0 Hammer headed bat, 1.0 Red brocket deer, 1.0 Proboscis monkey, 4.0 Wild cavy, 1.0 Egyptian fruit bat, 1.0 Nyala, 1.0 Sugar glider in pouch, 1.0 Yak, 1.0 Camel, 1.0 Patagonian cavy, 1.0 Talapoin monkey and 1.0 Pere David's deer; Reptiles - 30 Boa constrictors.

MEMPHIS ZOO AND AQUARIUM.....Robert L. Evans

The following births and hatchings were recorded during the month of April: 1.0 White rhino, 0.1 Pygmy zebu, 2.0 Pygmy goat, 1.0.1 California sea lion, 0.1 Camel, 1.1 Caracal lynx, 0.0.2 Puma, 0.1 Grant's zebra, 1.0 Bontebok, 1.0 Pere David's deer and 0.0.2 Chattering lory.

THE LONG BEACH ZOO.....Victor Pant

The Long Beach Zoo, one of the newest zoos in the United States, is proud to announce the following births and hatchings: 0.0.2 Chattering lory, 0.0.5 Cockatiels, 0.0.6 Peachface lovebirds, 0.0.6 Society finch, 0.0.4 Zebra finch, 2.1 Chinchilla and 0.0.1 Western toad.

WOODLAND PARK ZOOLOGICAL GARDENS.....Mary Bennett

Births and hatchings for the months of January, February and March of 1983 include: 0.0.3 Vampire bat, 1.0 Lion (DNS), 1.0 Llama, 0.0.2 African crested porcupine (0.0.1 DNS), 0.0.1 Celebes macaque, 0.0.1 Potoroo, 0.0.1 Jersey cow, 0.0.3 Patagonian cavy (0.0.1 DNS), 0.0.1 Springhaas, 0.2 Cotswold sheep, 0.0.1 Prairie dog (DNS), 0.0.1 Band tailed pigeon, 0.0.6 Small-billed tinamou, 0.0.2 White-cheeked touraco, 0.0.1 Cotton-top tamarin, 0.0.1 Straw colored fruit bat, 0.0.2 Golden lion tamarin, 0.0.4 Lesser Bornean crested fireback, 0.0.2 Pygmy marmoset, 0.0.1 Edwards lory, 0.0.1 Lion-tailed macaque and 0.0.1 Ring-tailed lemur.

MILWAUKEE COUNTY ZOO.....Steven M. Wing

April 1983 B&H from the Milwaukee County Zoo include: 2 Humboldt penguin, 4 Canada geese, 2 East African crowned crane, 1 Vampire bat, 1.1.1 Ruffed lemur, 1 Japanese Macaque (DNS), 1 Two-toed sloth, 1 Masked palm civit (DNS), 1 Miniature horse (DNS) and 1.0 Malayan tapir.

SAN DIEGO ZOO AND WILD ANIMAL PARK.....Karen S. Mosser

B&H for April 1983 include: 0.0.5 Ring-tailed lemur, 0.0.2 Brown lemur, 8.5 Black and white ruffed lemur, 7.7 Red ruffed lemur, 0.1 Francois' leaf monkey, 1.0 Pygmy chimpanzee, 2.0 Chinese dhole, 1.0 Mhorr gazelle, 0.1 Indian gaur, 0.1 Arabian oryx, 1.1 Sand gazelle, 4.1 Slender-horned gazelle; Birds - 0.0.1 California condor, 0.0.2 Razor-billed curassow, 0.0.9 Mikado pheasant, 0.0.2 Palawan peacock pheasant and 0.0.1 Nicobar pigeon.

BIRTHS AND HATCHINGS, Continued

DALLAS ZOO.....Tami Jones

The Dallas Zoo's B&H for the month of April include: Birds - 5 Mute swan, 1 White-winged dove (DNS), 1 Oriental turtle dove (DNS), 1 Nicobar pigeon, 2 Red-legged seriema, 2 Bleeding heart pigeon, 2 Spur-winged lapwing; Reptiles - 3 Crested basilisk, 7 Uracon rattlesnake, 21 Macquarie tortoise, 8 Pope's viper, 1 Red-footed tortoise; Mammals - 0.0.2 Patagonian cavy (DNS), 1.0 Axis deer, 0.1 Slender-horned gazelle, 0.1 Kirk's dik dik, 0.0.1 Celebes crested macaque.

BROOKFIELD ZOO.....John Stoddard

April 1983 B&H at Brookfield include: Reptiles - 0.0.1 Poison arrow frog, 0.0.8 Side-necked turtle, 0.0.28 Boa constrictor; Birds - 0.0.2 Blue-grey tanager, 0.0.2 Red and white crane, 0.0.4 Spur-winged plover, 0.0.2 Fairy bluebird, 0.0.2 Purple honeycreeper, 0.0.3 Jungle fowl, 0.0.2 Domestic turkey; Mammals - 0.0.12 White-toothed shrew, 0.0.12 Spiny mouse, 0.0.3 Spotted grass mouse, 0.0.2 Brown lemming, 0.0.5 Cuis, 0.0.10 Degu, 0.0.1 Brown Swiss cow, 0.0.2 Goeldi's marmoset, 0.0.1 Baboon, 0.0.1 Crab-eating macaque, 0.0.1 Sooty mangabey, 0.0.1 Capuchin, 0.0.1 Dall sheep and 0.0.3 Bobcat.

LINCOLN PARK ZOO.....Randy McMahon/Susan Moy

The following are the B&H for March 1983: Birds - 0.0.2 Wood duck; Mammals- 1.0.1 Emperor tamarin, 0.0.5 Pygmy marmoset, 0.0.7 Black and white ruffed lemur, 0.0.3 Cotton-top marmoset, 0.0.2 Geoffroy's tamarin, 0.0.1 La Plata three-banded armadillo, 0.0.2 Six banded armadillo, 0.0.1 Agouti and 0.0.6 Siberian polecat.

TOPEKA ZOOLOGICAL PARK.....Mike Coker

The Topeka Zoo recorded its first ever hatching of 0.0.2 Black swan during May 1983. Also born last month was 1.0 Japanese macaque and 1.0 Przewalski horse.



ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession. The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. Presently any correspondence to the PSC should be broken down as follows:

Kevin Conway
NZIP/Conservation & Research Center
Front Royal, VA 22630

MA,NH,VT,RI,ME,NY,PA,DE,CT,
WV,VA,MD,D.C.,NC,SC,TN,KY,
GA,AL,MS,LA, and FL.

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

WA,OR,CA,AZ,NM,CO,NV,WY,ID
and MT.

Steven M. Wing
Milwaukee County Zoo
10001 W. Bluemound
Milwaukee, WI 53214

OH,KS,NE,ND,SD,IN,IL,MI,MN,WI,
IA,MO,AR,TX,OK, ALASKA, HAWAII
and CANADIAN PROVINCES.



Coming Events

THE 7TH REPTILE SYMPOSIUM ON CAPTIVE PROPAGATION & HUSBANDRY

August 3-6, 1983

Dallas, TX

For further information contact: Dr. Peter J. Tolson, Program Coordinator,
Toledo Zoological Society, 2700 Broadway, Toledo, OH 43609.

5TH ANNUAL MEETING AMERICAN SOCIETY OF PRIMATOLOGISTS

August 7-10, 1983

Lansing, MI

For registration and further information contact: Dr. David M. Taub,
Yemassee Primate Center, P.O. Box 557, Yemassee, SC 29945.

THE 1983 AAZPA ANNUAL CONFERENCE

September 18-22, 1983

Vancouver, B.C.

The theme for the conference is "Survival in the Eighties". Hosted by
the Vancouver Aquarium. For registration and further information contact:
Murray A. Newman, Ph. D., Director, Vancouver Aquarium, P.O. Box 3232,
Vancouver, B.C., Canada V6B 3X8.

AMERICAN ASSOCIATION OF BOTANICAL GARDENS & ARBORETA AND AMERICAN ASSOCIATION OF ZOOLOGICAL HORTICULTURISTS (Joint 1983 Meeting)

September 20-25

San Diego, CA

For more information contact: Jim Gibbons, Horticulturist, San Diego
Wild Animal Park, Route 1, Box 725E, Escondido, CA 92025.

FOURTH ANNUAL ELEPHANT WORKSHOP

October 14-16, 1983

Kansas City, MO

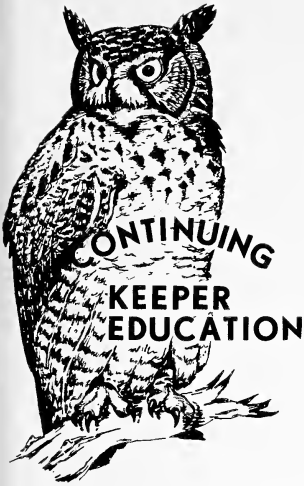
Hosted by the Kansas City Zoo. To be held at the Sheraton Royal Hotel.
For further information contact: Mike Blakely, Curator of Mammals, Kansas
City Zoo, Swope Park, Kansas City, MO 64132 or call (816) 333-7406.

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Park Zoological Gardens,
2200 North Cannon Drive, Chicago, IL 60614.



KEEPER EDUCATION AT THE TOLEDO ZOO

By
Michelle Grigore
Toledo AAZK Chapter Historian
Toledo Zoo, Toledo, OH

(In response to a request for information on what Zoos are doing regarding Keeper training, we received the following information from Michelle Grigore, Toledo Zoo's AAZK Chapter Historian. Toledo shares a common problem that comes up when Keeper training or education is addressed--i.e. the difference in the Keeper Staff in terms of experience vs. education; the old-timers and new-comers, both valuable assets to a keeping staff....Judie Steenberg, AAZK Education Committee)

Toledo Zoo Keeper Continuing Education Program

By way of introduction, our Zoo recently experienced a change-over from being city run to being owned and operated by the Zoological Society. This turnover opened a number of Keeper positions and introduced many new people to the Keeper profession. But, as a result, there was a difference in educational background and experience among the Keepers. In general, the new Keepers had some college education and minimal hands-on experience while the former City Keepers had years of experience, but little formal education. Yet almost everyone wanted a continuing education program open to all the Keepers at the Zoo. Our AAZK Chapter and our Zoo Director sanctioned an education committee which is comprised of one Keeper representative each from the Bird, Mammal, Reptile and Aquaria Depts., our Zoo Veterinarian, one Curator and the Coordinator from the Education Dept.

We met, and through Keeper surveys, have organized the programs listed below. Times and dates were decided upon by majority vote. Meetings are held approximately once a month on a Wednesday night at 7 p.m. and the first two programs have already been presented. Programs are videotaped for those who could not attend a class. Please keep in mind that these programs were all generated from within the Keeper Staff & Education committee, and utilize the educational opportunities within the Toledo area. I'm sure other AAZK Chapters could do the same and we'd be happy to give them more information.

1. Zoo Orientation What is a Zoo? What are the goals of the Toledo Zoo? Director Bill Dennler will talk about our Master Plan, ISIS and where we are going. The Curators will discuss their long-term goals.
2. Everything You Wanted to Know About Biology--But Were Afraid to Ask To give everyone an equal footing in future programs, some basic anatomy and physiology terms and processes will be covered here. Good for everyone to bone up on!

CONTINUING KEEPER EDUCATION, Continued

3. Visual Exams & Observations Dr. Tim, Zoo Veterinarian, will demonstrate examinations that Keepers can perform regularly to keep their animals healthy.
4. Murray Fowler's Handling & Restraint Slide Series Our Zoo Veterinarian and Curators will be on hand to discuss and possibly demonstrate the techniques shown.
5. Animal Behavior Dr. Vessey from Bowling Green State University will be our guest speaker as we look at the ways animals communicate with each other.
6. Endocrinology The chemicals which regulate so much that goes on in the animal body will be studied. May be a two-parter; the 1st class will cover basic terms & process, the next class could look at the way hormones affect animal reproduction and behavior.
7. Reproduction An in-depth look at animal reproduction with specialists in the field. Here's where we get to use some of those biology terms we learned; may be two sessions.
8. Digestion & Nutrition The complex process of how an animal uses its food will be covered...also, how diet affects your animal's health.
9. Parasitology A look at the most common parasites found in our Zoo animals would be helpful in understanding how to prevent their spread, and treatment of infected animals.
10. Antivenin O.K., you've been bitten by a venomous reptile! Now what? We'll look at the current antivenin treatment procedures.
11. Specific Courses--Possible specialists in ornithology, ichthyology,etc.....

Thank you to Michelle for sharing this information with the AAZK membership and our compliments to the Toledo Zoo for giving serious attention to Continuing Keeper Education.



Information Please

The Atlanta Zoo plans to update and improve its animal diets. We are asking other zoos, institutions or individuals to send us a list of their animal diets for the following: Old World monkeys and apes, bears, cats, Asian elephants, black rhinoceros, birds of prey, psittacines. Any comments concerning these diets will also be appreciated. Please send information to: Alan Sharples, c/o Atlanta Zoo, 800 Cherokee Ave., S.E., Atlanta, GA 30315.

The Audubon Zoological Garden would appreciate any information regarding reintroducing Malayan Sun Bear (Helarctos malayanus) or Sloth Bear (Melurus ursinus) mother and cubs to her exhibit mates (1.1) Send any information to: Lori Smith, Senior Zookeeper (Asian Domain), Audubon Park & Zoological Garden, P.O. Box 4327, New Orleans, LA 70178.

Information is requested for a comparative study of psittacine baby formulas. Please send any information on formulas that have worked and those that have not, and pertinent information on the birds involved to: Frank Muegge, 935 Johnfer Way, #107, Sacramento, CA 95831.

Reptile Amphibian potpourri

A SIMPLE, EFFECTIVE METHOD OF ELIMINATING LEECHES OF CAPTIVE TURTLES



By
Hank Guarisco
Animal Care Unit
University of Kansas
Lawrence, KS

Immersing turtles in a 0.5% povidone-iodine solution for 24 hours is a safe, effective means of eliminating ectoparasitic leeches.

On 7 April 1982, the University of Kansas Animal Care Unit received a shipment of 57 red-eared sliders (*Chrysemys scripta elegans*) from a commercial supplier of laboratory animals. Examination of the turtles revealed the presence of a large number of leeches (*Placobdella parasitica*) (Say) on the integument in the axillary cavity, on the neck, and in the inguinal cavity. It is important to remove these ectoparasites because, in addition to being bloodsuckers, leeches are intermediate hosts of hemogregarines and trypanosomes in aquatic herpetofauna (Marcus, 1981). After approximately 30 leeches were removed with forceps, it became apparent that a simpler, more effective method was needed.

The turtles were divided into two groups, and each group was placed into a stainless steel tank containing tap water. A small amount of povidone-iodine solution (Prepodyne® solution, West Chemical Products, Inc., Lynbrook, NY) was added to one of the tanks. The next day, the water from each tank was drained through a mesh strainer and a large number of dead leeches were recovered. It was evident that the leeches from the tank containing the brown povidone-iodine solution had ingested some of this solution since each stomach (which could be seen through the body wall) had taken on the characteristic brown coloration. Several turtles from each tank were examined. All were free of ectoparasites except one with a few dead leeches in the recesses of the axillary cavity. Since no live leeches were discovered in either tank, it was assumed that the chlorine level in the tap water was sufficient to effectively eliminate them. However, the chlorine level is known to be somewhat variable, especially on a seasonal basis. In the spring, these levels are increased in municipal water supplies to suppress the higher levels of bacteria and algae. Therefore, immersing turtles in chlorinated tap water is not a reliable method of eliminating leeches.

To determine the concentration of povidone-iodine solution needed to kill 100% of the leeches (LD₁₀₀), the live leeches that had previously been removed from the turtles were placed in five 2-ounce bottles containing: 20 ml of three different concentrations of povidone-iodine solution (0.05%, 0.5% and 5%) in tap water, 20 ml of tap water, and 20 ml of distilled water. The leeches in all the solutions except those in the distilled water appeared to be distressed and immediately climbed above the water levels. To ensure that the leeches remained in the solutions for a minimum time period, the bottles were closed with plastic caps and were then inverted. After ten minutes, they were placed in the upright position and the plastic caps were replaced with nylon mesh. Once again many of the leeches climbed above the water levels. This considerably reduced their total exposure time in the solution. After 24 hours, the number of survivors in each container was determined. All of the leeches in the 0.5% and 5% povidone-iodine solutions were dead (Table 1). Unlike the leeches that had been exposed to chlorinated tap water in the tank, the leeches in the bottle containing tap water survived their relatively brief exposure. It is interesting to note that the leeches attached to the turtles in the tank usually remained on their hosts, while those in the bottles climbed out of the irritating solutions. Those in the bottle containing chlorinated tap water were found in a cluster above the water line. The leeches in the distilled water, however, were randomly distributed throughout the container. Three were in the water and two were above the water line. Therefore, the chlorinated tap water appears to be distressful to them.

A SIMPLE, EFFECTIVE METHOD OF ELIMINATING LEECHES OF CAPTIVE TURTLES

(Continued)

TABLE 1

The lethal effects of povidone-iodine solutions on the leech
(*Placobdella parasitica*)

Solution (20 ml)	# live	# dead	total #
chlorinated tap water	5	0	5
distilled water	5	0	5
0.05% povidone-iodine	6	2	8
0.5% povidone-iodine	0	8	8
5.0% povidone-iodine	0	5	5

Koffler et al. (1978) have shown the cyclical pattern of leech infestation of the wood turtle (*Clemmys insculpta*) in the wild. *Placobdella parasitica* was commonly found on turtles in early spring and late autumn, but rarely during the summer months. The leeches apparently attach to their hosts in the fall and remain with them through the winter hibernation period. Feeding and nesting activities of the turtles which occur on land during the summer months, as well as basking would force the leeches to leave their hosts to avoid dehydration. Indeed, drying has also been suggested as a means of ridding captive turtles of leeches (Frye, 1981). Murphy and Collins (1983) suggested removing them with forceps, then treating the area with an antibiotic ointment. Marcus (1981) cautioned against this practice, and suggested the topical application of salt solutions or alcohol to encourage the leech to leave the host. Frye (1981) suggested bathing incoming turtles in a hypertonic saline solution before adding them to the collection. The results of the present study indicate that keeping turtles in a 0.5% povidone-iodine solution for 24 hours will effectively eliminate all parasitic leeches that may be present. This safe, efficient method has become a standard prophylactic procedure for incoming turtles at the Animal Care Unit of the University of Kansas.

References

1. Frye, F.L.: Biomedical and surgical aspects of captive reptile husbandry. Veterinary Medicine Pub. Co., Edwardsville, Kansas, 1981.
2. Koffler, B.R., R.A. Seigel, and M.T. Mendonca: The seasonal occurrence of leeches on the wood turtle, *Clemmys insculpta* (Reptilia, Testudines, Emydidae). J. Herpetol., 12(4): 571-572, 1978.
3. Marcus, L.C.: Veterinary biology and medicine of captive amphibians and reptiles. Lee & Febiger, Philadelphia, 1981.
4. Murphy, J.B. and J.T. Collins: A review of the diseases and treatments of captive turtles. AMS Publ. Co., Div. of Meseraull Printing, Inc., Lawrence, Kansas, 1983.

Acknowledgements

I wish to thank John B. Mulder of the Animal Care Unit for technical support, Paul Liechti of the Kansas Biological Survey for identifying the leeches, and Joseph T. Collins and John E. Simmons of the Division of Herpetology for critically reviewing the manuscript. This work was partially supported by grant RR 07037 from the Division of Research Resources, National Institute of Health.



"When it comes to prepared diets, keepers are more finicky than their animals."

AND THEY SHOULD BE!

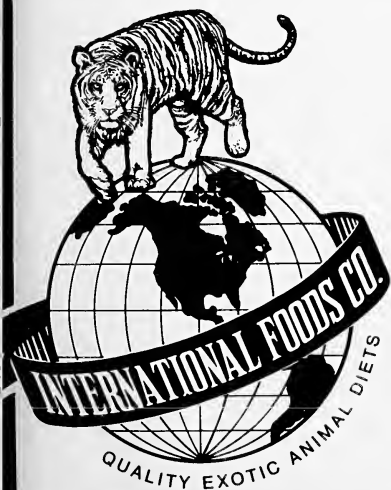
The keepers have a tremendous responsibility for the health and well being of their animals.

AT INTERNATIONAL FOODS COMPANY WE DON'T TAKE THAT RESPONSIBILITY LIGHTLY.

Our high quality diets have been carefully formulated to promote the physical condition and the reproduction of your animal collection. All of our products are conveniently packaged for ease in handling and feeding.

JUST AS IMPORTANT, WE HAVEN'T FORGOTTEN YOUR BUDGET. At International Foods Company you pay **ONLY** for high quality products, not a fancy name.

Please give us a call for prices and further information on our quality line of exotic animal diets.



- Carnivore Diet
- Bird of Prey Diet
- New World Primate Diet
- Old World Primate Diet
- Omnivore Diet
- Ratite Starter/Grower Diet
- Ratite Breeder/Adult Diet

INTERNATIONAL FOODS COMPANY, INC.
6200 North 56th Street
P.O. Box 29345
Lincoln, Nebraska 68529

CALL COLLECT (402) 466-8271

MAMMAL ANTICIPATORY CHART

By
James K. McIntyre
New York Zoological Park, Bronx, NY

My original intent upon undertaking this project was two-fold. One was to better acquaint myself with the 225-plus specimens of deer and antelope maintained at the "Wild Asia" section of the New York Zoological Park and the other was to try and determine whether there are any characteristics in common with the primi-partum females of each of the representative species. "Wild Asia" consists of 40 acres that can be viewed only during a 2½ mile, 25 minute monorail ride. This acreage is further broken down into subsections containing 13 species of mammals with each species representing a separate and diverse region of the Asian continent.

In order to become a more effective keeper, it is imperative for one not only to learn to recognize individual species characteristics, but also those characteristics specific to each individual. When numbers of species are kept small it is very possible to "know" each individual, but in a situation similar to that of "Wild Asia" with several hundred specimens to be accounted for, you can see how it is virtually impossible for a senior keeper, let alone a junior keeper who may not be steady at any particular installation, to recognize and know histories of particular individuals.

I came to find myself in the latter position, and while doing my research I was able to create the Mammal Anticipatory Chart, or MAC, which is, in fact, a female mammal reproductive status and species inventory chart. The MAC is an ongoing chart of all the females of a particular species in chronological age order. Included within each animal's section would be such vital information as parentage, date of birth, identification, medical history and a seasonal list of all births which in turn would contain date of birth, sex, status and comments. From this chart a person could tell immediately the status of each female of a particular group (i.e. lactating, pregnant, open, immature, etc.) as well as the probably parturition date of the breeding age females.

Included, I have created a hypothetical MAC dealing with Blackbuck Antelope (*Antelope cervicapra*) from the time three females were introduced to the zoo on 11/21/74 up to the partially completed birthing season of 1979. Glancing at this chart, one can quickly make the following deductions and derivations: Female A/B is a proven successful mother and is important to the group because she will accept orphaned calves. She has yet to give birth this season. Female C/D, who was unattentive to her first birth in 1975, possibly because she herself was not mother-raised, went on to be a successful mother and in fact gave birth twice during the 1977 season. Female E/F, whose primi-partum birth was still born, has since proven to be a viable herd member and has already given birth in 1979. Female I/J is an entirely different story. She is a hand-reared product of a mother who was also abandoned and hand-reared. She is a proven poor mother and from past history we can see that she herself for one reason or another has not raised a calf. We can easily anticipate that she again will probably abandon her calf and a special eye must be kept on her when birth is imminent. Special notation is also given to females U/V, W/X and A/Z as we can anticipate this season that they will give birth to their first offspring. Finally, female F/U, who was born 10/22/78 is still immature and will not give birth this season. Much information can be drawn from this single chart which allows for back checking and cross references.

MAMMAL ANTICIPATORY CHART, Continued

Mammal Anticipatory Chart
Blackburn Antelope (Antelope cervicapra)

SIRE DAM	Birth Date and History	Medical History and Comments	1975	1976	1977	1978	1979
- A/B	Born 3/18/71 purchased London Zoo 11/27/71	"Karen" will nurse orphaned calf	♂ 2/12/75 G/H	♀ 5/30/76 O/P	♀ 9/14/77 W/K	♂ 8/8/78 E/V "Tucker"	
- C/D	Born 1/11/73 purchased London Zoo 11/21/74	Abandoned at birth hand reared	♀ 4/17/75 I/J primi-partum Dam unresponsive pull to hand rear	♂ 6/16/76 Q/R	♂ 2/14/77 S/T ♀ 1/2	♀ 1/23/78 S/X Born outside shelter frozen to death	♂ 2/12/79 H/S
- E/F	Born 3/3/73 purchased London Zoo 11/21/74	Dislocated shoulder 8/17/76	♀ 8/31/75 K/L primi-partum stillborn	♀ 3/1/76 M/N	♀ 5/3/77 U/V	♂ 1/22/78 G/Y	♂ 2/12/79 I/R
64 I/S C/D	Born 4/17/75 Born in Park	Poor mother hand reared			♀ 11/11/77 A/Z primi-partum Dam unresponsive pull to hand rear	♀ 10/22/78 F/U Abandoned pull to hand rear	*
64 M/N E/F	3/11/76 Born in Park	caution Aggressive when with calf				♂ 12/2/78 G/T primi-partum breach birth - Vet Assist	
64 O/P A/B	5/30/76 Born in Park					♀ 5/14/78 D/W primi-partum died, premature	*
64 Y/V E/F	5/3/77 Born in Park						*
10 Y/X A/B	9/14/77 Born in Park	"Jenn"					*
10 A/Z I/S	11/1/77 Born in Park	hand reared					*
10 F/U I/S	10/22/78 Born in Park	"Rainie" hand reared					
	Born in Park	hand reared					

MAMMAL ANTICIPATORY CHART, Continued

Some additional information that can be eventually drawn from the MAC will be evident when species and individuals taper off reproductively as well as the telltale signs thereof. Life spans of captive-born specimens and actual time lapse between successive births will also be available at a glance. At any time during the birthing season, one could refer to these charts and discern not only which individuals have already given birth, but most importantly which have yet to calf or fawn and approximately when. This chart can serve to alert keepers to anticipate primi-partum births and to keep an eye on known problem birthers.

The MAC could be exhibited in the keepers' quarters and all keepers could then refer to these charts in regards to each individual animal and their reproductive status. The MAC could be best constructed of horizontal metallic magnetic plates on velcro strips, each representing a particular specimen. It is necessary that the MAC remain flexible as in the case of large collections where entries are continually added or subtracted; in the case of new acquisitions, births, deaths, transfers, loans, etc. I believe this chart can serve as a valuable management tool besides briefing keepers who travel from installation to installation on the status of the females. The MAC will also serve as an introduction to new keepers to the life cycles and breeding of the representative species at their particular institutions.



Keeper's Alert

TIP FOR BATS

*Submitted by Ken Kawata, General Curator
Milwaukee County Zoo, Milwaukee, WI*

Several months ago I received a form letter from a fellow keeper requesting information on captive care of bats. After I replied, describing what little I knew about bats, I phoned Dr. Merlin Tuttle, Curator of Mammology at the Milwaukee Public Museum. He indicated that there was a great deal of literature on the subject. Recently I visited with Dr. Tuttle at his office. He showed me the following books:

William A. Wimsatt, ed. 1977. BIOLOGY OF BATS, Vol. III, Academic Press.

Chapter 5 (519-617), by John Rasweiler IV, is entitled "The care and management of bats as laboratory animals."

Robert J. Baker, J. Knox Jones, Jr., Delford C. Carter, eds. 1976. BIOLOGY OF BATS OF THE NEW WORLD FAMILY PHYLLOSTOMATIDAE. PART I. Special Publications No. 10, the Museum, Texas Tech University.

There is a chapter entitled "Care in captivity" (pages 89-131) by Arthur M. Greenhall.

I was amazed by the number of citations in both books. There are hundreds of papers on husbandry of bats which will give you a good start whenever you plan to acquire bats at your zoo. My thanks to Dr. Tuttle who spent an hour with me.



HAND-RAISING BLACKFOOT PENGUINS
AT THE RIVERBANKS ZOO



By
 Forrest Penny, Birdkeeper
 Riverbanks Zoological Park
 Columbia, SC

In December 1974, 12 wild-caught Blackfoot Penguins (*Spheniscus demersus*) were received and housed in a glass-fronted indoor pool exhibit in our Birdhouse at Riverbanks Zoo. During the following eight years, we've enjoyed moderate success with our breeding program, with 24 penguins having successfully fledged. Considering the threatened status of Blackfoots in the wild, we attach a high priority to obtaining the full breeding potential from our captive colony. While we currently have five breeding pairs among our 23 specimens, only occasionally have both eggs of a two-egg clutch been raised to maturity. We therefore felt it might be worthwhile to pull one of the two eggs from the nest, when both were found to be fertile, and to attempt artificial incubation and hand-raising of these chicks upon hatching. Not only might this allow for the survival of the second chick which is often lost, but it should also improve the chances for the first chick which now receives the full attention of its parents.

Our interest and enthusiasm for attempting to establish such a permanent program (penguins had been hand-raised in isolated cases earlier) was bolstered by the outstanding success experienced by Hubbs-Sea World Research Institute of San Diego since December of 1977 in hand-raising Adelies and Humboldts. An extensive article, titled Penguin Propagation at Sea World, San Diego (1979-80) by Frank Todd presents detailed information on techniques involved in their penguin propagation program and was a vital aid to our staff at Riverbanks.

Assuming both eggs of a clutch are fertile when candled (approximately 10 days), the smaller egg of the clutch is taken from the parents and placed under artificial incubation at a dry bulb temperature of 96°F (35.8°C) and a wet bulb temperature of 86.5°F (30.0°C). The egg is manually rotated four times daily to insure proper development and is transferred to a hatcher box when pipping begins (36-40 days). The hatching process appears to be a relatively slow one, as the time from pipping to actual hatching took up to 48 hours. Once the chick has dried sufficiently and is strong enough to stand, it is again moved to a brooder box cage where the temperature is maintained at a reading of 90°-95°F (33°C) for the first 5-7 days.

The chicks generally weigh 65-70 grams upon hatching and, while they exhibit very little feeding response for the first 12-24 hours, the young birds can usually be coaxed to take their first samples of the penguin soup by the second day. This "soup" formula is based on the diet described by Sea World in the previously mentioned article. The ingredients we use to make one quart of formula include:

235.6 g North Pacific Zooplankton (*Euphasia pacifica*)
 235.6 g herring fillets
 120-160 cc water (enough to give consistency of a thick milkshake)
 160 cc Half & Half
 0.8 cc predigested protein
 1 Seatab
 2.65 cc Vitamin B complex #4
 1 Vitamin E capsule (1000 I.U.)
 8 g Dicalcium phosphate

HAND-RAISING BLACKFOOT PENGUINS AT RIVERBANKS ZOO, Continued

The chicks are fed five times daily (over a 10 hour period) for the first five days, using a lcc syringe. Some patience and a little coercion are usually required during the first two days, and care must be taken to insure the chick is not overfed or allowed to aspirate any of the formula. The fifth feeding is dropped after the first five days and, after 15 days, the chick is normally cut down to three feedings per day. The general rule of thumb is to feed the chick 10% of its body weight at each feeding, assuming it demonstrates a vigorous feeding response. A misprint occurs in the Sea World article in paragraph 3 of page 20, which states that the chicks were fed 10% of their body weight daily. In our first hand-raising attempt, we adhered to this figure despite the chick's apparent appetite for larger servings. After the third week we became concerned over the chick's poor weight gains to that point and became suspect over the prescribed feeding amounts stated in the article. A long distance phone call verified these suspicions--the amounts of "soup" to be fed should have read 10% of body weight per feeding, rather than daily. We immediately increased the size of our feedings, and also began to supplement the "soup" diet with small chunks of smelt fillet which the chick, named Eeyore, took readily.

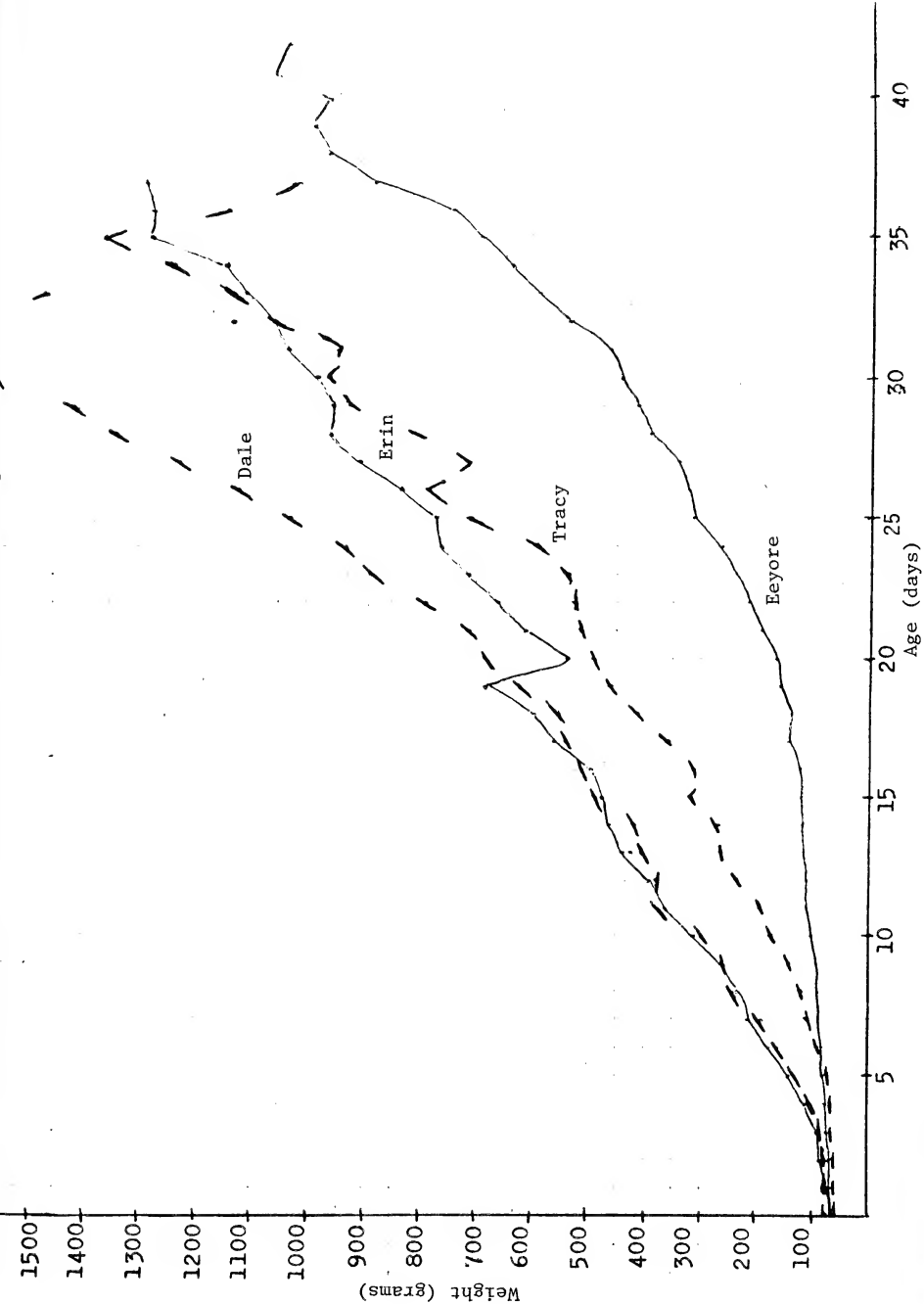
Eeyore's daily weight gains began to increase dramatically and, at the beginning of the fourth week, he was offered small whole smelt. The chick was apparently doing well and gaining as much as 80 grams per day when a slight drop in appetite was noticed on 29 June. Showing no other obvious signs of stress, we felt that the chick's metabolism might have begun to slow down, having reached an age (6 weeks) where this is sometimes observed in our parent-reared birds. It came as a total shock the next morning when we discovered that Eeyore had died overnight, the necropsy revealing an internal bacterial infection.

While we were discouraged by this loss, we were already committed to another hand-raising attempt, as a second egg under artificial incubation had hatched out a week earlier, on 23 June. This chick, named Erin, at 63.5 grams weighed slightly less than did Eeyore upon hatching. Erin, receiving much larger feedings during the first three weeks than were given Eeyore, gained weight considerably faster and on 29 July, at roughly five weeks of age, joined two exhibit-raised chicks in a back-up chamber to our exhibit. Erin seemed quite competitive with those two chicks in every way and was released to our exhibit when he completed his molt to juvenile plumage at nine weeks of age. Two more attempts at hand-raising penguins have since resulted in the successful fledging of Dale, who hatched on 22 July weighing 71.8 grams and Tracy, weighing 63.0 grams at hatching on 10 October. Dale showed the best weight gains of all four birds, weighing 1401.2 grams at five weeks of age. The graph in Figure I illustrates the comparative growth rates of each of these four chicks during their first five weeks. The poor start and slow weight gains of the first chick, Eeyore, are quite evident in this graph and can be attributed to the restricted feeding amounts given this chick during the first three weeks.

While the average weight of these four chicks at five weeks of age (1260.2 g) is noticeably less than that of our exhibit-raised penguins at the same age (1848.7 g), the hand-raised birds appear to have closed the gap considerably by the time they have completed their molt to juvenile plumage and are released to the exhibit with the rest of the colony. Penguins Erin, Dale, and Tracy are all quite competitive with the other juveniles, even during feedings which often resemble a mob scene. These three behave as normal penguins at this time and will hopefully become successful breeders themselves when they attain sexual maturity at 3-4 years of age.

While we are now reasonably confident that we can consistently raise Black-foot Penguins in the future, it should be noted that we are doing so only to supplement our established breeding program with parent-raised penguins.

Fig. 1: Comparative growth rate for 4 hand-raised Blackfoot Penguins.



HAND-RAISING BLACKFOOT PENGUINS AT RIVERBANKS ZOO, Continued

As with most other species at Riverbanks, we prefer to leave the rearing process to the natural parents, and will continue to hand-raise Blackfoots only as long as it increases the number of healthy, normal-behaving penguins produced by our colony.

REFERENCES:

Todd, F.S.: 1980 Penguin Propagation at Sea World, San Diego 1979-80, Hubbs-Sea World Research Institute, San Diego, CA.

PRODUCTS MENTIONED IN THE TEXT:

Krill Fish Food: freeze-dried N. Pacific zooplankton (*Euphasia pacifica*) by Aqua Stock, Inc., Bayonne, NJ 07002.

LPP Predigested Collagen Protein: by Twin Laboratories, Inc., Deer Park, NY 11729.

Seatabs: vitamin & mineral supplement for marine mammals by Pacific Research Laboratories, Inc., P.O. Box 1877, El Cajon, CA 92022.

Vitamin B Complex #4 by Rugby Laboratories, Inc., Rockville Center, Long Island, NY 11570.

Vitamin E Capsules by Interstate Drug Exchange, Inc., Plainview, Long Island, NY 11803.

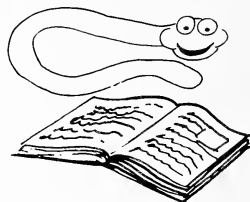
Dicalcium Phosphate by Parke-Davis, Inc., Detroit, MI 982322.



Book Review

Mountain Sheep: A Study in Behavior and Evolution

By Valerius Geist
University of Chicago Press
5801 S. Ellis Ave., Chicago, IL 60637
383 pages, paperback (\$9.00)



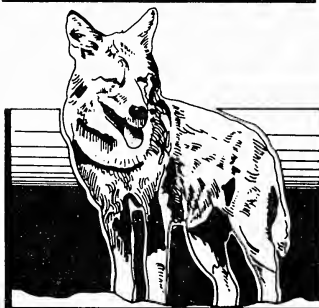
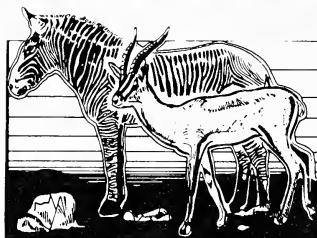
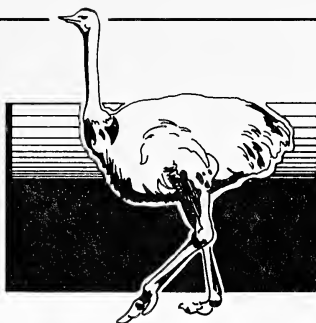
Review By Janice Richards
Senior Keeper, Auckland Zoo
Auckland, New Zealand

This is an excellent publication that clearly explains numerous facets of not only Mountain Sheep, but goats, sheep and some antelope throughout the world.

While the book deals primarily with the Mountain Sheep of North America, a subject on which the author did four years field work, many other interesting and valuable facts dealing with Asian, African and European species are mentioned. The book is very well illustrated with 89 black and white plates, 77 Tables clearly laid out and very easy to understand and a series of 48 graphs and comparative sketches. Texts like this which present such a complex study in a manner that is relatively easy to read and comprehend are very few and far between. I could not think of a single point of behavior, population dynamics, evolutionary trends of sheep-goat variations that has not been commented on. The author has also gone to the trouble to elucidate on his methods of data collection and sex-age classifications.

This book is a must for anyone at all interested in the sheep and goats of the world in general and the mountain dwellers in particular. Mountain Sheep has been written by a man who is undeniably an expert in this field and such valuable books can rarely be purchased at such a modest price.





for your
captive
audience

Spectrum offers
a complete line of
High Quality
Food Products,
and we're proud of
the Professional Service
we give our Customers.

Zu/Preem

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

EXCLUSIVELY DISTRIBUTED BY



Animal SPECTRUM Inc.
5801 Locust Street
Lincoln, Nebraska 68516

Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-6492

THE STRUGGLE FOR SURVIVAL

TWO CONDOR CHICKS HATCHED IN CAPTIVITY

The first two California condor (*Gymnogyps californianus*) chicks to hatch in captivity have increased the hope that this critically endangered species may yet be saved from extinction. Both chicks apparently are healthy and are responding to the special care they are receiving at the San Diego Wild Animal Park. The young birds were started on a gruel of water and finely chopped mice, which was later supplemented with regurgitated vulture food, similar to what they would have received from their natural parents. Zookeepers are feeding the chicks with hand puppets that resemble the heads of adult condors to keep the chicks from imprinting on humans. The sex of the two condor chicks will not be known for several months, but biologists hope that they will someday be part of a captive breeding group that will produce offspring for release in the wild.

The chicks hatched from eggs taken from two of the five known condor nests in the wild. Intensive observation of paired condors during the past breeding season provided conclusive proof that if their first egg is lost, the pair will lay a replacement egg. The California Fish and Game Commission granted the joint FWS/National Audubon Society condor research team permission to take the first egg from all condor nests. On Feb. 2, the breeding pair that lost two eggs last year during squabbles over incubation rights produced its first egg of the season; the egg was taken on Feb. 23 by team biologists and transported to an incubation chamber at the San Diego Zoo. The chick emerged from its shell on 30 March. (Although the troubled condor pair produced a second egg, disputes like those that occurred last year again erupted, and researchers took the egg on 8 April for artificial incubation as a precaution. However, the improper incubation it received from its natural parents during early embryonic development has probably damaged the egg's chances of hatching. A second egg taken on 8 March from a different pair hatched in captivity on 5 April. Both chicks have been transferred from the San Diego Zoo to the Zoo's Wild Animal Park where they will be raised in a quarantined area near other captive vultures.

The two immature male condors taken into captivity last year after their chances for survival in the wild had come into question are now doing well at the Los Angeles Zoo.

---Endangered Species Technical Bulletin

Legislative News

Compiled by Kevin Conway
AAZK Legislative Coordinator

PROPOSAL TO REMOVE RED, EASTERN GRAY AND WESTERN GRAY KANGAROOS FROM THE U.S. LIST OF ENDANGERED AND THREATENED SPECIES

On 8 April, the Fish and Wildlife Service (FWS) published in the *Federal Register* a proposal to remove the red kangaroo (*Macropus rufus*), eastern gray kangaroo (*Macropus giganteus*), and western gray kangaroo (*Macropus fuliginosus*) from the U.S. List of Threatened and Endangered Wildlife. At the same time, the FWS is proposing to continue commercial importation of kangaroo products. This rule will only be necessary if the attempt to delist kangaroos fails.

These three kangaroo species were listed as threatened in 1974 because of great concern that too many kangaroos were being killed to sustain viable populations. At that time, the FWS imposed a ban on the import of kangaroo products until the Australian Government could assure the U.S. that there was an effective management program for kangaroos and that the taking was not detrimental to the survival of the species. In April 1981, the ban on importation of products was lifted when the Australian Government provided the above assurances. The ban was lifted for two years. At the close of the period, FWS was to reconsider the commercial importation.

The Australian Government has petitioned the U.S. to delist these species and has submitted substantial information to support the delisting. If these three species are removed, the restrictions, regulations or prohibitions of the Endangered Species Act will not apply.

---K. Vehrs
AAZPA Newsletter
May 1983

BATS REMAIN IN JEOPARDY, DEFENDERS OF WILDLIFE REPORT

Bats are disappearing at an alarming rate all over the world, victims of unjustified prejudice in the Americas and greed and superstition throughout much of Europe and Asia, according to *Defenders*, the magazine of Defenders of Wildlife. Nearly everywhere, bats are killed whenever possible; their large densely packed colonies in vulnerable places, such as caves, make them easy targets. Furthermore, their usually slow rate of reproduction makes recovery extremely difficult.

In the U.S., bats are intensely feared and persecuted, simply because they are easily misunderstood, DoW said. Frightening myths are vastly exaggerated by pest control companies intent on lucrative exploitation of public fears. The fact is that the 40 bat species that live in the U.S. are invaluable insect controllers. A single bat may snatch two insects out of the air in less than five seconds, as many as 900 in an hour, and more than 3,000 in one night. In its appetite for such fare as fruit flies, mosquitoes and gypsy moths, the bat has few rivals, DoW said.

The echolocation system whereby the bat sends out ultrasonic pulses and reads the echoes from obstacles or prey is phenomenal, DoW noted. Scientists have estimated that, watt for watt and ounce for ounce, the bat's echolocation system is far superior to the best man-made radar or sonar ever devised. The human ear can hear sound at frequencies up to 20,000 cycles per second, but a bat can echolocate with sound frequencies ranging from 50,000 to 230,000 cps. Mysteries still surround their feats of

LEGISLATIVE NEWS, *Continued*

navigation. One series of experiments showed that bat brains synthesize magnetite during migration seasons. A migrating bat may be following some built-in compass needle of its own manufacture. Finally, the bat has received bad press as a carrier of parasites. In truth, a bat is as clean as a cat and no more prone to spreading rabies than other animals. More people die every year from dog attacks than die from bat diseases in a generation. And humans have little to fear from the fewer than 1% of bats that ever actually contract rabies because these bats seldom become aggressive.

Some bat species are already extinct and many U.S. species now exist only as small remnants of their former populations. U.S. species listed as endangered include the Virginia big-eared bat (found in parts of Kentucky, West Virginia and Virginia), Ozark big-eared bat (a native of Missouri, Oklahoma and Arkansas), gray bat (central and northeastern U.S.), Indiana bat (East and Midwest), and Hawaiian hoary bat (indigenous to the Hawaiian Islands).


Most of these species are victims of human killing in their cave roosts. Thousands at a time are killed intentionally by vandals, and many more die from unintentional disturbance by cave explorers. Such intrusions exhaust hibernating fat reserves or cause young to be abandoned or dropped by panicked mothers. Bats in the hundreds of thousands have been killed in a single day when their caves have been flooded, gassed, dynamited, or bulldozed shut, destroying not only bats but entire cave ecosystems.

A U.S. Fish and Wildlife Service team has prepared recovery plans for gray and Indiana bats, and much progress has been made, DoW said. Several caves containing the largest nursery and hibernating populations have been acquired and are now protected. While prospects for gray and Indiana bats are improving, people still need to be educated regarding the value and plight of bats. Most of the world's largest bat colonies are already gone, and the few that remain are extremely vulnerable.

For further details on bat conservation, write Bat Conservation International, c/o Milwaukee Public Museum, Milwaukee, WI 53233.

---from ECOLOGY USA
March 14, 1983

environmental T-SHIRTS



FREE CATALOG!

18 GREAT DESIGNS.
10% OF PROFITS GO TO
ENVIRONMENTAL CAUSES. © MAPLEWING 1983

JIM MORRIS P.O. BOX 2308 DEPT. SF3
BOULDER, COLO. 80306

SATISFACTION GUARANTEED!

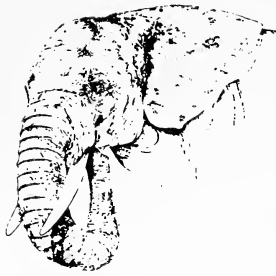
SHARE THE EARTH!



A SECOND LOOK AT AFRICA

By

Mary L. Swanson, Carnivore Keeper
Fresno Zoo, Fresno, CA



For nearly four weeks in late July and early August 1982, I accompanied my director, Dr. Paul Chaffee, on another tour of Africa. In 1980, some of our group had gone with him to west and east African countries. But now we were going to a less commonly visited part of Africa, southern Africa, at a totally different season--winter. We were to see animals deep in South Africa, in Zimbabwe, and in Botswana. It turned out to be a terrific trip, worth every cent I had to mortgage my house for, in order to pay for the trip.

We began by flying over the Kalahari Desert and the vast Okavanga Delta to Botswana, where we were met by our crusty guide, Doug Skinner. In unusual game-viewing trucks he had pieced together himself, Doug took us to our tent camp at Moremi Game Reserve, set in the middle of a beautiful mopane forest and on the edge of the Okavanga Swamp. Camping out in Botswana in winter can be very COLD at night, but it was still one of the best parts of the whole trip. We were to move camp two more times in our Botswana tour---and each camp site would have its excitements--lions wandering through camp at night, or baboons, or vervets, and elephants in camp in daylight, or the wild dogs and honey badgers raiding a garbage can at night.

But best of all was our close access to the wild animals. In Botswana there are few people (only 800,000 pop. in an area similar in size to more populous Kenya), and, in winter, few tourists. So we had the freedom of seeing hundreds of animals without the disturbance of other tourists' vehicles very often. We could spend hours at a waterhole if we wished, and we were even able to view animals by "walking safaris".

The Okavanga River begins in Angola, flows eastward, but never reaches the Indian Ocean. Instead it disappears into the earth after forming the great swamp known as the Okavanga Delta out in the Kalahari Desert. Here, by boat (a few steps from our tent camp) we viewed marvelously beautiful plant life of reeds, etc. with abundant species of birds--including the striking pygmy goose, and African jacanas living up to their nickname of "lily trotters"--and, of course, lots of hippos and a few crocodiles.

On land we saw numerous species of mammals and birds--huge herds of cape buffalo at sunset, the red lechwe antelope that lives in swampy areas, elephants, impala, roan antelope, hyenas, wild dogs, lions, honey badgers, sable antelope, sassaby (tsesesebe) and hundreds of bird species. Among the latter we had the thrill of seeing two rare species, the saddlebilled stork and the wattled crane, feeding together in the same little piece of marsh.

Other sights were not always so pleasant. Near the border with Namibia, we found a poached white rhino, one that had only recently been re-introduced to Botswana where white rhinos had all disappeared a few years ago. This rhino had been dead less than 48 hours and vultures were just beginning to work on the carcass. He had been deprived of his horn, of course, by the poachers. Our guide, Doug, told us that it was common practice for poachers to come by helicopter across the river from Namibia, use an

A SECOND LOOK AT AFRICA, Continued

automatic weapon on the rhino, then use a chain saw to remove the horn, and take off again--a process taking only 10 minutes total! Nearby, we found 36 carcasses of cape buffalo, shot with automatic weapons for no apparent reason. Hunting safaris are also common in Botswana, priced by species--for example, one can still hunt elephant for \$600 per day, minimum of 21 days (price and terms taken from ad in an airline magazine). Doug told us they hope that at least the elephant will be taken off the "game" list in Botswana in 1983.

On this trip we were seeing southern Africa during a severe drought, which meant the animals were congregating more at the few waterholes, making it easier for us to view them. The year before, Dr. Chaffee had been visiting the same area and the contrast was startling. At that time, the Savuti Channel had been filled with water. This year it held only three feet of muddy water. At one spot we sat on the bank and counted 55 hippos, 16 big crocodiles, and a mass of huge catfish struggling to keep their bodies wet. Herds of 25-30 bull elephants kept coming to drink and bathe. Shy kudu slipped in briefly. We took endless pictures, but slides could never give our friends back home the full effect--because the over-crowded muddy waterholes exuded a terrible stench, like a gigantic sewer. Many of our party were overwhelmed with pity for the animals (one young hippo was dead already). But our guide told us that the adult animals would probably survive because when they became desperate enough, they could trek 30 miles to another source of water.

Soon we arrived at the Chobe River ourselves and saw what he meant. Here were hippos wallowing in deep water covered with aquatic vegetation, troops of chacma baboons on shore, and both bull elephant herds and matriarchal elephants herds with tiny babies, bathing, drinking, rolling in the mud and returning to the river. Some even played in the water. We were able to walk near and drive amongst the hundreds of elephants. Later some of them wandered nonchalantly through our camp, calmly chomping bushes.

We have thoroughly enjoyed our nearly 10 days of camping out--the "game" runs at dawn, the incredible numbers of birds and mammals, and the delightful evenings around the campfire. But now it was time to move on--to Victoria Falls in Zimbabwe. Seeing the famous falls was one of the great experiences of the trip. Even though this was a drought year with "low" water, the falls were spectacular. It was even more exciting to fly over the huge falls in small planes. Along the misty paths by the falls we saw two animals seen only in this area--the Trumpeter Hornbill and the Chobe Bushbuck (the latter sub-species occurs only in a 100 sq. mile area of Africa).

After we left Victoria Falls, we went on to Wankie National Park (now called Whange) in Zimbabwe. There we had three excellent young naturalists guides taking our group out to view animals from land rovers. During our stay they taught us the basics of reading elephant tracks so we could tell the direction they were going, the size of the animal, etc. They showed us elephant rubbing trees and stumps where elephants had rubbed the bark smooth and shiny scratching their skin. Local people chip off bits of these rubbed areas to make beautiful buttons. We also found huge holes where elephants had dug down to reach mineral-rich dirt to eat. We spent hours at waterholes watching Chapman's zebra, Masai giraffes, sable antelope, and many other animals drinking. This was especially nice during the beautiful sunsets. At night we went out for "spotlight" runs, where we saw hundreds of spring hares, grey duikers, common jackals, bush pigs, and, for me, the great delight of seeing a magnificent leopard only 12 feet away.

After all too short a stay in this fascinating park, we flew to the Cape

A SECOND LOOK AT AFRICA, Continued

area of South Africa, spending time in Capetown and Zululand. At our Zululand Safari Lodge, we found two magnificent white rhino grazing right outside our room doors, accompanied by cattle egrets. We were disappointed in a visit to Hluhluwe Game Reserve (pronounced "sheh-shloo-wee") because management had just done a controlled burn and the wildlife had fled. We intended to visit Umfolozi Park where the Fresno Zoo's white rhino had come from, but, it too had been burned. So instead, we went to Mkuze Park, where they have a large photographic blind (called Msinga) built out into the middle of a waterhole. The floor is covered with rubber--the rule is silence and no smoking and one watches the animals through a foot-high slit in the walls. We spent an astounding two hours here filming hundreds of zebra, wildebeest, impala, chacma baboons, many birds, kudu, the beautiful shaggy nyala antelope and three colors of wart hogs (grey, light rust and rusty-red). We wished we had more time.

Then we went on to one of the biggest highlights of the trip---we spent the night with the Zulu people in a place called Kwabhekithunga Kraal. We had a marvelous visit with this loving, warm, spirited people who make up the largest ethnic population in all South Africa. We learned a great deal about their customs, history, music and art. It was not a phony Disneyland-type tourist set-up. We were truly welcomed by these beautiful people. I would not be suprised (and would hope it happens soon) to hear that the Zulu will be the governing majority in South Africa.

The remainder of our time in Africa was spent in the Capetown area, shopping, eating great food, and visiting the Cape of Good Hope and Cape Point, where the Atlantic and Indian Oceans meet. But even on the Cape we found native animals--in a park that was stark and wind-blown, but had Cape hyrax, chacma baboons, ostrich, many sea birds, Cape hartebeest, springbok and the beautiful bontebok.

Our nearly four weeks in southern Africa was marvelous. We had experienced elephants at virtually touching distance. We had seen animals that exist only in this part of Africa. My list of animals sighted included species of 38 mammals, 2 reptiles, and 120 birds, plus several insect species. We had seen unforgettable sights, such as Giant Kingfisher catching fish, young bull elephants sparring, vervets stealing sugar from our camp table, and that beautiful leopard sauntering through the brush at night.

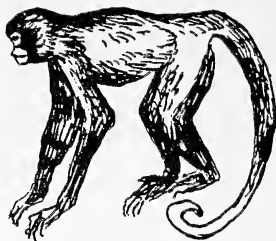
There were also the sad memories of the poached rhino, the tacky, ugly elephant's foot stool with the zebra skin seat, and the elephant ivory carvings for sale everywhere. The worst sight was getting off the plane in New York to find that some of our fellow passengers were claiming guns at the luggage rondevaal--guns they had used on a hunting safari in Botswana.

But we knew we had had the better trip. We had sat peacefully at waterholes watching beautiful African antelope, elephants, zebras and birds. We had captured them on film, not with a bullet. We had seen them while there was still time to see them in the wild. We could only hope that the governments of southern Africa can soon afford stronger efforts to preserve these magnificent animals.



Exhibit Options

TROPIC WORLD/ASIA EXHIBIT OPENS AT BROOKFIELD ZOO



A new continent emerged just west of Chicago on 15 May 1983, when the Brookfield Zoo opened its new Tropic World/Asia rain forest environment. The second part of the largest indoor zoo exhibit anywhere, Asia includes apes, monkeys and other mammals, and birds--all living together much as they would in the jungles of Sumatra and Indonesia.

Forty-five foot trees, mangrove swamps, sweeping vines, regular thunderstorms and a towering peninsula covered with huge banyan trees and surrounded by a deep river are all part of the environment created by the Brookfield Zoo for the families of orangutans, long-tailed macaques, the very vocal siamang, the gibbon lesser apes, the Asian small-clawed otters and a mix of colorful exotic birds including the brilliant fairy bluebird, Shama thrush, magpie robin and green-crested wood partridge.

Over 1.5 million people--among them H.R.H. Prince Phillip, head of the World Wildlife Fund International--have visited Tropic World since the first "continent," Africa, opened last May. When the Duke encountered the gorillas, monkeys, hippo, and exotic birds, he pronounced the exhibit "fascinating...a real experience."

But what the animals think of Tropic World is something of a mixed bag.

In Africa, 450-lb. Samson gorilla still reigns, while his two playful 1½-year-old babies begin to learn the ropes of the huge exhibit as thier mothers look on. The five species of monkeys, all with babies, mix more or less peaceably as they climb about the trees, rocks and waterfalls. Sassy hippo, however, could do without the monkeys, it would seem: they steal her hay and generally create a ruckus around her otherwise placid pool.

In new "Asia," reactions range from enthusiastic to awestruck on the animal's part.

If their 110-decibel "whoops" are any indication, the siamang pair with baby are right at home swinging through the high canopy of trees, while the macaques--all 13 of them--seem to like their new home so much that only rarely do they make the nightly exit to off-scenes cages where they are to be fed and checked by keepers. On the other hand, the gibbons' door has been opened repeatedly, but they have so far declined all invitations into the exhibit.

Caliban otter, a seven-year-old male, who with his mate, ten-year-old Ophelia, had been living until recently at Lincoln Park Zoo, got his first taste of Asia recently when his door to the river was opened. Ophelia stood in the hatchway and watched as ever so slowly Caliban poked his nose into the water and then inched the rest of his body in. A couple of quick turns around the exhibit, including a walk on the Monkey's Island, and Caliban seemed much more at home, indulging in a couple of side-trips on his way back to Ophelia.

TROPIC WORLD/ASIA OPENS AT BROOKFIELD ZOO, Continued

The orangutans are another story. While ten-year-old Hanah and her baby Pongo rather quickly settled into their tree nest high on the peninsula, 360-lb "daddy" Sam took over a day to muster enough curiosity and nerve to venture into the huge exhibit.

Regarded by the zoo's exhibit designers and animal staff as the ultimate test of Tropic World, Brookfield's seven orangutans have lived up to their reputation. Someone is disconnecting and unraveling the thick, epoxy-covered rope "vines" like so much yarn. The culprit could be 23-year-old Katie, her son Ronald, nine, or maybe even three-year-old Pepper. The most likely candidate, however, is the official "tester" of the exhibit, Robin, six. The defiant young male orang had the honor of being the first animal in Asia; this so that he could tell the zoo planners what, if anything, was wrong with his new home.

To be sure, Robin found a few things. His first day on the peninsula, Robin found the steep, supposedly unclimbable, sides far from orang-proof: the young male was ascending into Asia's "sky" when his keepers headed him off. Those wall surfaces were promptly slicked and on Day Two were markedly less attractive to Robin.

Instead, the testy "tester" headed for the 22-foot sides of his huge home. Seeking to venture into monkey territory and investigate his fascinating neighbors, the young orang began to try to climb down the steep walls of the peninsula. Reflections warning of water far below finally dissuaded Robin on the ultimate worth of the trip. He has since turned his attention to his animal neighbors and the trees, nests, leaves, hay-- unraveling vines--at hand.

"This is the kind of exhibit we wanted, one for the animals, " said Brookfield's Director, Dr. George Rabb, "one that would bring the people into the animals' home, so that we might all learn something about the wildlife that is our heritage on this earth--and our responsibility to protect."

Tropic World addresses this issue in three parts. As with "Africa," which opened last May, and "South America," to open in mid-1984 for the zoo's 50th anniversary, Tropic World/Asia focuses on endangered species from rain forest areas around the world. Such areas are presently being developed out of existence at a rate of thousands of acres per day. Tropic World is, in large part, a vehicle for this conservation message.

---Excerpted from Brookfield Zoo
Press Release of 6 May 1983



FIRST FLIGHT

By

Gary Lillo
Former Keeper, Topeka Zoo
Topeka, KS



*She rides the sky in search of food,
While far below awaits her brood
Of two young chicks hatched out today,
Whether they'll make it, no one can say.*

*Having hatched together the chances are good,
Like all new parents, there's hope that they would.
As the days go by, the two chicks grow larger,
And little by little they go a bit farther.*

*Then the day comes for the first real test,
To take to the skies and leave behind the rest.
The parents fly first and call to the chicks,
Who are still on the ground stumbling through weeds and sticks.*

*Then finally one takes the first big step,
Flapping wings wildly with vigor and pep.
Now the other's off too, they fly neck and neck,
They swoop and sway and look like they'll wreck.*

*But then they calm down and smooth out their flight,
If you've never seen it, it's a beautiful sight.
To see such a bird, so keen and so swift
Soaring the clouds with only the wind as its lift.*

*So try as I do, I can't understand
Why some idiot would shoot one to show he's a man.
But all too often they do and till this day I could cry
Because if you ask he who's done it, he doesn't even know why.*

*But happily, statistics will show,
That the numbers still flying continue to grow.
So I myself thank all the people like you,
Who have all chosen to do what you do.*

*To take the sick, weak and injured and try as you might,
To build them up stronger and restore their precious gift of flight.*

*---Dedicated to the Keepers and Staff of the Dickerson Park Zoo,
Springfield, MO and to all the others involved in raptor
rehabilitation.*

Announcing...

New AAZK Publication Available



AAZK is pleased to be able to offer its members and other interested individuals in the zoo community the newly published mammal reference booklet entitled **BIOLOGICAL VALUES FOR SELECTED MAMMALS**. This 55-page work contains biological data on 200 species of mammals. Included in the data are: common name, scientific name, range, gestation, weaning, lifespan, sexual maturity, litter size, estrus cycle, body temperature, and names used for the male, female and young of, each species. References for data given are also included.

This informative publication was researched and compiled by a team of zookeepers, docents, interns and zoo volunteers at the San Francisco Zoo. Formatted for quick and easy reference, and charmingly illustrated, this booklet will surely be an important addition to any zoo keeper's library. AAZK has arranged for 50% of the profits, after initial costs are met, to be assigned to the San Francisco Zoological Society, a non-profit support organization of the San Francisco Zoo.

BIOLOGICAL VALUES FOR SELECTED MAMMALS is being offered to AAZK Professional members for only \$1.25. Other membership categories and non-members may purchase the booklet for \$2.50. Prices include postage and handling. To order, fill out the form below or send necessary information to: **Biological Values Book, c/o AKF Editorial Offices, 635 Gage Blvd., Topeka, KS 66606**. Make check or money order payable to: "Biological Values/AKF".

BIOLOGICAL VALUES ORDER FORM

Please send _____ copies at \$ _____ each to:

Name _____

Address _____ City _____

State _____ Zip _____

Please check membership category: P() AF() AS() INST() NON-MEM()

Conference.....83

FINAL CALL FOR PAPERS

DEADLINE JULY 15, 1983

Papers are requested for the 1983 AAZK National Conference. Suggested topics are: 1) Historical aspects of zoos and zookeeping and 2) Other topics of general interest pertaining to the field of zookeeping. Papers will be limited to 20 minutes with a five minute question/answer period. The registration fee for the conference will be reduced for those people whose papers are accepted. Please submit an outline or abstract by 15 July 1983. Send papers to:

Bob Berghaier, AAZK Conference
Philadelphia Zoo
34th St. and Girard Ave.
Philadelphia, PA 19104

IMPORTANT NOTES

...Please note that the reservation form for the hotel is to be mailed to the Holiday Inn and NOT to the Philadelphia AAZK Chapter. The check for the first night's deposit should be made payable to the University City Holiday Inn. The hotel will hold a block of rooms for the conference until 2 September 1983. After this date, reservations will be based on availability.

...Please send the conference registration form and check payable to the Philadelphia Zoo Chapter, AAZK to:

Gene Pfeffer
Conference Registration
Philadelphia Zoo Chapter AAZK
34th St. & Girard Ave.
Philadelphia, PA 19104

...Please don't forget your animal-related item for the auction!!

...Please register as early as possible. The hotel will hold a block of rooms until September 2 ONLY. After that, it's based on availability.



Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

NAME: _____ AAZK MEMBERSHIP STATUS & FEE:

ADDRESS: _____ Member or Spouse.....\$50.00

CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00

ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
(After 15 August, 1983)

PHONE NUMBER: () _____

ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____

AREA OF INTEREST _____

WILL YOU BE SUBMITTING A PAPER? YES NO
(\$15.00 will be refunded from registration fee upon acceptance of paper)

NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____

VEGETARIAN? YES NO. If YES, Special Instructions _____

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.

AAZK Accessories Available

Pins And Charms: Enameled three-quarter inch pins and charms with the official AAZK logo are now available. They are done in the same colors as the AAZK Patch and the charms are suitable for necklaces (you provide the chain). The price per pin or charm is \$3.50 which includes postage. To order send your name, complete mailing address, number of pins or charms desired to: AAZK National, 635 Gage Blvd., Topeka, Ks 66606. Make check or money order payable to AAZK National.

Buttons: For a "Keepers Care" Button, send the coupon and 50¢ to: Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614.



Decals: The official AAZK decal is available through the Memphis Zoo Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.50 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Ave., Memphis, TN 38107.

AAZK T-shirts with the official emblem are now available from the Phoenix Chapter. The price is \$6.75 including postage and handling. Sizes Small, Medium, Large, and Extra-Large are available in two colors: Tan with dark brown logo and Dark Brown with white logo. To order, complete coupon below or copy information and send with check or money order to: Mike Carpenter, 906 N. Hayden, #3, Scottsdale, AZ 85257. Make checks payable to "Phoenix AAZK Chapter". Shirts will be returned by 1st Class mail.

AAZK T-Shirt Order Form

Please send _____ T-shirts at \$6.75 each. COLOR: TAN _____ BROWN _____

SIZE: _____ Small _____ Medium _____ Large _____ Extra-Large

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

KEEPER DATA SURVEY

(Editor's note: All Keepers who are members of AAZK are asked to fill out the following questionnaire and return it to: Mary Slaybaugh, Co-Coordinator for the Keeper Data Survey, 1916 Gillespie, San Antonio, TX 78212. You may use this form from AKF, photocopy the form and then fill it out or answer the questionnaire on a separate sheet.)

Personal information: Name (optional) _____

Address (optional) _____

Sex _____ Age _____ Last year of schooling completed: _____

Grade school 12345678

High school 1 2 3 4

College 1 2 3 4

Post Grad _____

Number of years as a Keeper _____ Number of Zoos worked in _____

Name of present place of employment _____

Other animal related positions held (include both domestic and exotic related jobs) _____

Types of animals worked with: Herps Birds Land Mammals--Large/Small
Marine Mammals Fish Insects Other (please specify) _____

When did you know you wanted to be a Keeper? _____

Why did you become a Keeper? _____

Do you plan to make a career of Zoo work? YES NO

If your future goals are other than a career Keeper, are they animal related? _____

Have you experienced burn-out i.e. frustration with management, animal care, other keepers' attitude toward job, boredom etc.? _____

What, if anything, did you do to cope with it? _____

What is the pay scale at your zoo? _____

What are the opportunities for advancement? _____

What is the ratio of men to women? _____

Who supports your zoo -- State County City Private Zoological Soc.
Other (please specify) _____

What else would you like to know about your fellow Keepers? _____

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

Assistant Zoo Director...requires degree in zoology or biology, with emphasis in field zoology, five years' recent experience in care of zoo animals, two years' supervisory experience, communication skills in public speaking, writing and/or teaching. Salary \$22,339-\$27,144.

Zoo Veterinarian...requires three years' experience in the practice of exotic animal medicine. Salary \$29,931-\$36,337. For both positions, contact Miriam Hall, Personnel Board of Jefferson County Alabama (205) 325-5531 for application information. Send resume to Bob Truett, Director, Birmingham Zoo, 2630 Cahaba Rd., Birmingham, AL 35223.

Development Director...requires BS, five years' experience as development officer in nonprofit and exposure to membership, special events, PR and variety of fund-raising programs. Proven supervisory and organizational experience essential. Prior zoo involvement desirable. Salary commensurate with experience. Send resume to Ann Gilkey, Administrative Officer, Atlanta Zoological Society, 800 Cherokee Ave., SE, Atlanta, GA 30315 (404) 624-1235.

Keeper Trainee...limited number of positions available. To participate in a one year training program with appointments to a permanent keeper position upon successful completion. Training period salary \$14,600. Submit resume to Mary O'Neill, Personnel Director, Minnesota Zoo, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124 (612) 432-9010. Deadline is 25 June 1983.

Bird Keeper...requires experience in captive management of birds. Responsible for care and maintenance under supervision of head bird keeper. Degree in zoology or related field desirable. Salary \$10,000 plus fringe benefits. Send resume to Tim Krause, Asst. Director, Jacksonville Zoological Park, 8605 Zoo Rd., Jacksonville, FL 32218 No Phone Calls.

Bird Keeper...responsible for daily feeding, maintenance, health, behavioral observations and public contact. Strong foundation in ornithological studies and avian husbandry experience desired. Excellent salary and fringe benefits. Submit resume to Personnel Department, Brookfield Zoo, Golf Rd., Brookfield, IL 60513 (312) 485-0263

Reptile Keeper...responsible for reptile inventory, knowledgeable in exhibit design and basic husbandry techniques. Experience required. Two years' college in related field desired. Salary \$5.21/hr. Send resume to Edward Posey, General Curator, Central Florida Zoological Park, PO Box 309, Lake Monroe, FL 32747

o
p
p
k
o
r
t
u
n
i
t
y
n
o
c
k
s

AAZK MEMBERSHIP APPLICATION

Name _____ *Check here if renewal []*

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST



Animal Keepers' Forum

Animal Dominion Publications, Inc.



Dedicated to Professional Animal Care

JULY 1983

Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
 Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
 Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
 Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
 Steve Taylor, Louisville Zoo, Louisville, KY 40213
 Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
Patti Kuntzmann, Philadelphia Zoo	Randy Adolph, St. Louis Zoo
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
Judie Steenberg, Woodland Park	Frank Kohn, Turtle Back Zoo
<u>Historical Committee</u>	<u>Awards Committee</u>
Larry Sammarco, Lincoln Park	Mike Crocker, Dickerson Park Zoo
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
Kevin Conway, NZP/CRC, Front Royal	Kevin Conway, NZP/CRC, Front Royal

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
Karen Siarr Wakeland	Ellen Leach, Woodland Park Zoo
<u>Staff Exchange</u>	<u>Program Library</u>
Elandra Aum, Woodland Park Zoo	Mike Crocker, Dickerson Park Zoo
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
Bernie Feldman, Topeka Zoo	Mike Coker, Topeka Zoo
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
Oliver Claflay, Metro Toronto	Steve Taylor, Louisville Zoo
<u>Diet Notebook</u>	<u>Membership Directory</u>
South Florida Chapter, Miami	Pat Sammarco, Lincoln Park
	<u>Keeper Data Survey</u>
Mary Slaybaugh, San Antonio Zoo	Dave Orndorff, Sea World Shark Institute

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Vacancy	ME, VT, NH, MA, RI, CT
Vacancy	NY
Gene Pfeiffer	PA, NJ, MD, DE
Angela Keppel	VA, W. VA, D.C.
Randy McGill	MI
Lynne Villers	IN, OH, KT
Larry Sammarco	WI, IL, MO, MN, IA
Vacancy	TN, NC, SC
Alan Sharples	FL, AL, GA
Vacancy	AR, MS, LA
Candy Kroft	TX, NM, CO, OK, KS, NE, SD, ND
Laurence Gledhill	WA, OR, ID, MT, WY, AK
Joan Stinson	CA, NV, AZ, VT, HI
Vacancy	Canada

This month's Keeper/Artist is E. Anne Miles, who works at the Reptile World Serpenterium in St. Cloud, FL. Her drawing is of an Eastern diamondback rattlesnake (Crotalus adamanteus). Thanks Anne!

Scoops and Scuttlebutt

NEW "ZOOKEEPING AS A CAREER" BROCHURE AVAILABLE

The newly revised, color AAZK career brochure entitled "Zookeeping As A Career" is now available from National Headquarters. Individual copies of the brochure may be obtained by sending a stamped, self-addressed envelope to "Career Brochure", AAZK National Office, 635 Gage Blvd., Topeka, KS 66606. Bulk orders for use at career fairs and for other educational purposes may be ordered at 100 copies for \$5.00 plus postage and handling. Those wishing to order such quantities should send their request to Dolly Clark and she will invoice your group or chapter for the order.

The AAZK Publications Staff wishes to thank Judie Steenberg and the members of the Education Committee for their assistance in revising and updating the text. We would also like to thank the following AAZK Chapters who donated funding for the brochure: Puget Sound Chapter, Rio Grande Chapter, Metro Toronto Chapter, South Florida Chapter and the Topeka Zoo Chapter. We also thank those zoos and individuals who submitted photographs for the brochure.

CONNIE CLOAK LEAVES TOPEKA ZOO FOR NASHVILLE

Connie Cloak, former Associate Editor of AKF and current AAZK Board Member, has resigned her position at the Topeka Zoo and is moving with her husband Tim to Nashville, TN. Connie's efforts on behalf of AKF and AAZK are appreciated by us all. We will miss her. She can be reached at P.O. Box 24693, Nashville, TN 37202-4693.

ADT FORM COORDINATOR MOVES TO TOPEKA ZOO

Bernie Feldman, Coordinator for the AAZK Animal Data Transfer Form (ADT) has taken a position at the Topeka Zoological Park. Comments, questions and orders for ADT forms should be sent to him c/o AAZK National Headquarters, 635 Gage Blvd., Topeka, KS 66606.

Bernie would like to request that all keepers who did not fill out and return the ADT Form Survey (April 1983 AKF, Page 135) to please do so as soon as possible. Please send completed forms to Bernie at the above address.

Members are reminded that the ADT Forms are a free service offered to all zoos and aquaria by AAZK. We hope you will encourage the use of the ADT Form at your institution.

Births & Hatchings

WOODLAND PARK ZOOLOGICAL GARDENS.....*Mary Bennett*

Births and Hatchings for April 1983 include: 4.1 Domestic sheep, 0.0.2 Lesser Bornean crested fireback, 0.0.2 Orange and black arrow poison frog, 0.0.1 Band-tailed pigeon, 1.1 Alpine dairy goat, 0.0.4 Monk parakeet, 0.0.1 Humboldt's penguin, 0.0.1 Bison (DNS), 0.0.1 Black-necked stilt (DNS), 0.0.1 Small-billed tinamou, 0.0.2 Palawan peacock pheasant, and 0.0.1 Black and white colobus.

MEMPHIS ZOO AND AQUARIUM.....*Robert L. Evans*

The following B&H were recorded at the Memphis Zoo during the month of May 1983: 1.0.2 Black and white ruffed lemur, 1.0 Nilgiri tahr, 1.1 Pere David's deer, 1.0 Blesbok, 1.0 Sable antelope, 1.0 Scimitar-horned oryx, 1.3 Siberian ibex, 1.0 Bontebok, 0.0.6 Leopard gecko, 0.0.5 Mute swan, 0.0.1 Java rice bird, 0.0.1 Chestnut-breasted mannikin, 0.0.2 Inca tern, 0.0.2 Golden-mantled rosella, 0.0.4 Roul-roul, 0.0.4 Wood duck, 0.0.6 Peafowl, and 0.0.2 Hartlaub's touraco.

LINCOLN PARK ZOO.....*Randy McMahon/Susan Moy*

The following are the B&H for May 1983: Reptiles - 0.0.4 Yellow ratsnake; Birds - 0.0.4 Wood duck, 0.0.1 Nicobar pigeon, 0.0.1 Grosbeak, 0.0.3 Golden breasted starling; Mammals - 0.0.2 Patagonian cavy, 0.0.1 Sea lion, 1.2 Snow leopard, 0.0.1 Black and white ruffed lemur, 0.0.1 Owl Monkey (DNS), 0.0.1 Japanese macaque and 0.0.1 Black howler monkey (still born).

TOPEKA ZOOLOGICAL PARK.....*Alice Miser*

The World Famous Topeka Zoo officially began its Golden Zoobilee celebration on 15 May with a record-breaking crowd of over 14,000 in attendance. Some of the recent B&H visitors were able to view include: 0.0.1 Blue crowned pigeon, 0.0.3 Lilac breasted roller (1 DNS), 0.0.2 Red and white crane and 1.1 African pygmy goat. Also born during June was 0.0.1 Thick tailed galago (DNS).

SAN DIEGO ZOO.....*Conny Carson*

A baby kiwi, believed to be only the second hatched outside of New Zealand or Australia, was hatched at the San Diego Zoo on 22 April. This notable birth ended on an unsuccessful note of 12 May when the young bird succumbed to a bacterial infection. The kiwi hatchling, a female, appeared to have a poorly developed thymus, a gland important in establishing the bird's immune system thus leaving it vulnerable to infection.

The San Diego Zoo has long been involved in a captive breeding program with the National Zoo and the Auckland Zoo in New Zealand. The Zoo has experienced four years of unsuccessful attempts to hatch the national bird of New Zealand. Sixteen infertile eggs had been produced prior to the successful hatching noted here. The kiwi is unique among living birds because of two nostrils at the end of its beak which it uses to sniff out worms and grubs. The female kiwi weighs between 5-6 pounds and lays a one pound egg, the largest egg in proportion to body weight of any bird. The kiwi male incubates the single egg for approximately 2½ months and raises the baby for up to a year.

BIRTHS AND HATCHINGS, Continued

"This is an extremely sad loss of a bird baby we were proud to have hatched after years of effort," said Art Risser, curator of birds. "We can only learn from this first experience, proceed with our valuable kiwi breeding program and hope for better success with our next kiwi hatching."

DALLAS ZOO.....Tami Jones

May was a super month for B&H at the Dallas Zoo, they include: Birds - 2 White-cheeked turaco, 3 Fulvous whistling duck, 5 Himalayan impeyan pheasant (3 DNS), 1 Abyssinian ground hornbill, 1 Oriental turtle dove, 1 White-winged dove, 5 Lesser Canada goose, 1 Grey peacock pheasant (DNS), 2 Society finch, 4 Chochin bantam (1 DNS), 4 Pied crow; Reptiles - 2 Mexican lance-headed rattlesnake, 18 Macquarie turtle; Mammals - 1.0 Kirk's dik dik, 1.1 Suni, 0.1 Plains bison, 1.0 Dama gazelle, 0.1 Blackbuck antelope, 0.2 Klipspringer (1 DNS), 1.0 Hamadryas baboon, 0.1 Giraffe, 1.0 Eland and 3.0 Snow leopard.

MILWAUKEE COUNTY ZOO.....Steven M. Wing

B&H for May 1983 include: 7 Barn owls, 1 Wallaroo, 1 Red kangaroo, 2 Japanese macaque, 1 Black and white colobus, 2 Masked palm civet, 2 Snow leopard, 1.2 Caribou, 0.1 Eland (DNS), 1.0 Impala, 1.3 Dall sheep and 8 Yellow anaconda.

BRONX ZOO.....Margaret Price

B&H at the Bronx Zoo for the months of April and May 1983 include: Mammals - 2 Blackbuck, 2 Mouflon, 9 African spotted grass mouse, 6 Pere David's deer, 3 Pen-tailed bettong, 1 Brush-tailed phalanger, 9 Wild cavy, 1 Fruit bat, 2 Degu, 1 Maxwell duiker, 3 Minnie downs mouse, 2 Egyptian fruit bat, 1 Slenderhorn gazelle, 4 Domestic sheep, 1 Lesser long-tongued bat, 2 Siberian tiger, 2 Acouchi, 2 Cotton-top marmoset, 4 Barasingha deer, 1 Guanaco, 1 Patagonian cavy, 2 Reeves muntjac, 1 Yak, 2 American bison, 1 Wisent, 1 Axis deer; Birds - 10 Crested tinamou, 1 Inca tern, 1 Red and white rail, 6 African spur-winged plover, 3 Barn owl, 5 Scarlet ibis, 1 King vulture, 2 Tawny frogmouth, 4 Rothchild's mynah, 3 South African shelduck, 2 White-naped crane, 9 Ringed teal, 2 Hooded crane, 1 Malayan wreath-billed hornbill, 2 Indian shama thrush, 3 Hooded merganser, 1 Barheaded goose, 1 Bornean greater argus pheasant, 5 Lilac breasted roller, 3 Mandarin duck, 1 Red crested cardinal; Reptiles - 16 Jamaican boa and 1 Desert skink.



Don't forget to Vote!!

REMINDER FROM THE NATIONAL AAZK ELECTIONS COMMITTEE

During the month of July all Professional Members will receive their ballots to vote in the national election. Members will receive biographical sketches of the candidates as well as a ballot and return envelope. Voting members are asked to mail their ballot in the provided envelope ONLY to National Headquarters in Topeka, KS. The unopened envelopes are forwarded to the Nominations and Election Committee who tabulate the results. Remember to send in your ballot before the deadline of 31 August 1983.

Coming Events

ELEPHANT BREEDING SYMPOSIUM

September 16, 1983

Portland, OR

Held at the Washington Park Zoo. For information, contact J. Marks Bieberle, Washington Park Zoo, 4001 SW Canyon Road, Portland, OR 97221, (503) 226-1561.

THE 1983 AAZPA ANNUAL CONFERENCE

September 18-22, 1983

Vancouver, B.C.

The theme for the conference is "Survival in the Eighties". Hosted by the Vancouver Aquarium. For registration and further information, contact Murray A. Newman, PhD., Director, Vancouver Aquarium, P.O. Box 3232, Vancouver, B.C., Canada V6B 3X8.

FOURTH ANNUAL ELEPHANT WORKSHOP

October 14-16, 1983

Kansas City, MO

Hosted by the Kansas City Zoo. To be held at the Sheraton Royal Hotel. For further information, contact Mike Blakely, Curator of Mammals, Kansas City Zoo, Swope Park, Kansas City, MO 64132 or call (816) 333-7406.

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Grand Rapids, MI

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Sacramento, CA

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

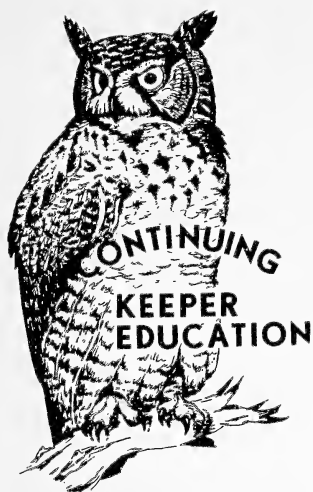
April 15-17, 1984

Omaha, NE

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 29-May 1, 1984

Philadelphia, PA



COMMITTEE UPDATE

By

Judie Steenberg
Chairman, C.K.E. Committee

June '83 marked one year since the official beginning of the Keeper Education Committee. Following are brief status reports on the three preliminary projects decided on in Toronto.

---Arrangements for making the Safety videotape have been finalized, and Wayne Buchanan will begin taping in

July. If all goes as planned, the tape will be available for membership preview at the Philadelphia Conference.

---The results of the year-long Reference Search will be available for review at Philadelphia also.

---The Toronto Manual of Zoo Keeping is the second manual undergoing review by Committee members throughout the country. We have recently received Keeper manuals from Mill Mountain, Little Rock and the Auckland, New Zealand Zoos. It is hoped that all materials received to date will be circulated through the Committee and evaluations reviewed well before the Conference. There is still time to send in a copy of your Zoo's manual.

I've received a few comments during the past few months about AAZK writing a Keeper Manual...In Toronto discussion at the workshop resulted in a decision against writing a separate manual. The Committee opted to see what's available as a preliminary step. As it now stands, there are no immediate plans to write an AAZK manual, the thought being that we would be duplicating work already done. That decision may hold, or it may undergo a change after the next Keeper Education workshop in Philadelphia.

"FEED BAG" COMING

Good news from Toronto. A new column on animal nutrition will be starting as a regular feature in AKF. The Toronto Chapter, and Dr. Sergio Oyarzun, Metro Toronto Zoo's Nutritionist have enthusiastically agreed to receive questions on Zoo animal nutrition and to publish the answers in AKF. The column will start in the August issue.

This is an excellent opportunity to have your questions on Zoo animal nutrition answered by a Nutritionist working at a leading Zoological facility. A column such as this needs questions to get it started and to keep it going!...here again, it's up to you! Take a few minutes right now and jot your questions down...DON'T PUT IT OFF!..it'll take only a few minutes.

Neville Pike has advised that the Chapter will forward the questions to Dr. Oyarzun, and mail the answers to AKF. Mail your questions to: "Feed Bag" c.o Metro Toronto Zoo AAZK Chapter, P.O. Box 280, West Hill, Ontario, Canada M1E 4E5.

CONTINUING KEEPER EDUCATION, Continued

ANIMAL MANAGEMENT CORRESPONDENCE COURSE

ANIMAL MANAGEMENT is a British correspondence course for "...people who look after animals in zoos, wildlife parks, wildlife collections, dolphinarium and aquaria." Following is an excerpt from the 1982-83 course guide of the National Extension College, Dept. Z 18 Brookland Avenue, Cambridge CB2 2HN, ENGLAND.

"Animal Management is a correspondence course with practical assessment. The aims of the course are to provide students with the knowledge and skills to work with zoo animals in a professional capacity, and to improve the standard of animal management." They advise that the course takes about two years to complete; there will be phased entry in September and January. Students taking the course are expected to have a project and a Zoo tutor. Current tuition costs are 60 pounds for the course with an additional 8 pound charge for overseas students living outside of Europe.

There is a problem with North American students testing on the course for certification, but negotiations have started on a solution. Douglas Richardson, Howletts Zoo, has made inquiries to the College on the availability of tutors to correct assignments, and the certification of students outside of Britain on the final exam. We will keep you advised on what develops.

Jan Richards, Auckland Zoo gives the following recommendation on the course: "...speaking as someone who is just completing it, it is well worth it. It had the number one advantage of being wholly designed for Keepers." We would like to hear from you if you are taking the course, or have taken it. Send your comments to: Judie Steenberg, 9550 2nd Avenue N.W., Seattle, WA 98117.



ASSISTANCE SOUGHT IN PROFESSIONAL STANDARDS COMMITTEE SURVEY

The Professional Standards Committee of AAZK is conducting a survey of hiring standards and criteria for zookeepers on a nationwide scale. The objective of this committee is to compile a general overview of professional standards as set forth by our own profession. The Committee would like to call on all AAZK members for assistance in reaching our objective. Each member can help us by submitting a copy of their zoo's job description for zoo keepers, or hiring standards used to select candidates for a keeper position. Presently any correspondence to the PSC should be broken down as follows:

Kevin Conway
NZIP/Conservation & Research Center
Front Royal, VA 22630

MA, NH, VT, RI, ME, NY, PA, DE, CT,
WV, VA, MD, D.C., NC, SC, TN, KY,
GA, AL, MS, LA, and FL.

Jan McCoy
Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97201

WA, OR, CA, AZ, NM, CO, NV, WY, ID
and MT.

Steven M. Wing
Milwaukee County Zoo
10001 W. Bluemound
Milwaukee, WI 53214

OH, KS, NE, ND, SD, IN, IL, MI, MN, WI,
IA, MO, AR, TX, OK, ALASKA, HAWAII
and CANADIAN PROVINCES.



ELEPHANT SET

ADJUSTMENT PROCESS OF AFRICAN ELEPHANTS TO A NOVEL SITUATION

By
Ellen Katy Lake
Department of Biological Sciences
Wichita State University, Wichita, KS



ABSTRACT

The purpose of this study was to describe the adjustment process of African elephants when separated from companions and introduced into a new enclosure. Two elephants were observed for fourteen sessions in the novel enclosure and for five sessions in their regular exhibit areas. Each session lasted thirty minutes and was divided into three ten-minute periods. Seven defined behaviors were tallied by two observers simultaneously. The proportion of behaviors indicative of investigation and stress revealed when an animal had adjusted to the new situation, i.e. after adjustment investigative behaviors consistently predominated over behaviors indicative of stress. Each elephant also adjusted differently to the novel situation.

INTRODUCTION

Despite observations of African elephants in the wild, semi-natural habitats, and in captivity, no documentation exists of an animal's adjustment to temporary separation from companions and transfer into novel surroundings (Douglas-Hamilton, 1975; Adama and Berg, 1975). Nonetheless, a captive elephant is likely to face such a novel situation at least once, if not several times throughout its life.

In order to conduct various psychological tests on the African elephant (*Loxodonta africana*), it was necessary to isolate the previously unseparated subjects and allow them to adjust to a specially designed room. This made the subjects appear excited. In stressful situations it has been noted that an African elephant exhibits ear extensions, trumpeting, and agitated forms of locomotion (Adams and Berg, 1975; Kuhme, 1962).

The purpose of this study was to describe the adjustment process in terms of changes of certain behaviors so that a standard could be used to tell when an animal was suitable for further research or other zoological purposes.

MATERIALS AND METHODS

SUBJECTS

The subjects were two female African elephants named Cinda and Steph, each approximately ten years old and in good health. Both were wild born in East Africa and have lived at the Sedgwick County Zoo since 1972.

APPARATUS

The new environment was a holding room adjacent to the elephant's main living quarters. The room is approximately 1400 square feet and was constructed with an escape hall, heated floor and lights and was off public viewing.

PROCEDURE

Sessions were conducted before and after the elephant's normal daily routine. Only the animal keeper was allowed to transfer and handle the

ADJUSTMENT PROCESS OF AFRICAN ELEPHANTS TO A NOVEL SITUATION, Continued

elephants. Although the subjects were both physically and visually separated, it was still possible for them to hear and presumably smell one another. For the first seven sessions, a small amount of alfalfa was provided in the holding room for positive reinforcement. Also, immediately following the sessions, both elephants were rewarded with additional food.

As soon as a subject was securely shifted, the observation session began. Cinda was observed during September and October of 1980; whereas observations of Steph were conducted in July of 1981. Both elephants were observed for fourteen sessions. The days between sessions ranged from 1-4 for Cinda and 1-2 days for Steph with the average intervals 2.7 and 1.6 respectively. Also, Steph was initially so stressed that the first three sessions were shortened to only twenty minutes.

Observations were made from the hallway, approximately three meters from the perimeter of the holding room. The sessions were divided into three ten-minute periods. To check for inter-observer validity, observations were simultaneously recorded by two observers. The following are the descriptions of the behaviors scored (the behaviors previously described by Kuhme, 1962; and Adams and Berg, 1975 are indicated by an asterisk).

Ear extensions--both ears move forward rapidly to or beyond a position which is perpendicular to the body axis.*

Trumpeting--vocalization; loud-sounding air expulsion.*

Agitated locomotion--sudden, swift body movements; complete or incomplete circles or whirls; head shakes; kneeling or pawing*

Rumbling--growl or purr; type of vocalization produced deep in the throat.*

Investigation--reaching of trunk into different areas; manipulating objects; sniffing; i.e. when the subject is not feeding or engaged in other specific behaviors.*

Ramming bars--charging or backing into bars; counted only when sound was produced.

Several other miscellaneous behaviors were observed, such as tail-wagging and temporal gland secretion, but they were not sufficiently measured for analysis here.

Control observations were made when the two elephants were together during their normal routine. Controls for Cinda were made in the outdoor exhibit, whereas control observations of Steph were made in the enclosed exhibit. The outside exhibit had no bars for the elephants to ram.

RESULTS

Comparison of the scoring by two observers showed a high correlation which ranged from .87 to .95 for four behaviors; i.e. ear extensions, trumpeting, agitated locomotion, and investigation (Spearman-Rank Test). Both elephants exhibited the same general behaviors during the sessions, but they differed in the frequency of certain acts (See Table 1). Although Steph trumpeted, extended her ears, rammed the bars, and investigated more often than Cinda, the only significant difference was in the frequency of ramming the bars (Mann-Whitney-- U, $P < .01$). Cinda exhibited more rumbling sounds during the sessions than Steph, but this difference was not significant.

TABLE 1
MEDIAN FREQUENCIES OF BEHAVIORS

Behaviors	Experimental		Control	
	Cinda	Steph	Cinda	Steph
Stressful behaviors				
Ear extensions	5	4.5	4	5.5
Trumpeting	0	0	0	0
Agitated locomotion	2	4.5	0	0
Ramming bars	3.5	14.5*	0	0
Investigative behaviors				
Investigation	17	38.5	3	16.5
Other behaviors				
Rumbling	14.5	5	8	3.5
Tail-wagging	22	22.5	17	22

* $p < .01$

Both of the subjects showed a reversal in the predominance of stress and investigative behaviors over time. The proportion of investigative and stress behaviors for each subject are shown in Figure 1. The total number of stress behaviors was the sum of the frequencies of ear extensions, trumpeting, agitated locomotion, and ramming the bars. Cinda began to switch from a predominance of stressful behaviors to one of investigation after the fifth session which became stable by the ninth session.

Although Steph showed a similar reversal, the pattern was different. In the first four sessions, there were oscillations in the stressful and investigative behaviors. At a point during each of the first three sessions, Steph became so agitated that it was deemed necessary to terminate the session early for the sake of the elephant's well-being. These oscillations then are an artifact of the way in which the behaviors were scored. As with Cinda, by the fifth session, investigative behaviors began to predominate. There was a reversal of this trend in the ninth session presumably caused by the presence of a third and unfamiliar observer.

Likewise, the predominance of investigative over stressful behaviors occurred throughout the control observations in all but one instance. In this situation the subject was pawing at the ground which was defined as part of agitated locomotion. This occurred in the outdoor exhibit and is frequently observed in wild elephants while dusting themselves (Douglas-Hamilton, 1975). Therefore, the context of this behavior does not suggest that the subject was stressed.

Within the session, analysis of the three periods showed each elephants was different in its response to the novel environment. Figure 2 compares the changes in investigation, stress, and rumbling after the ninth session when the elephants' responses had stabilized. Cinda showed a steady increase in investigative behaviors as the sessions progressed, whereas

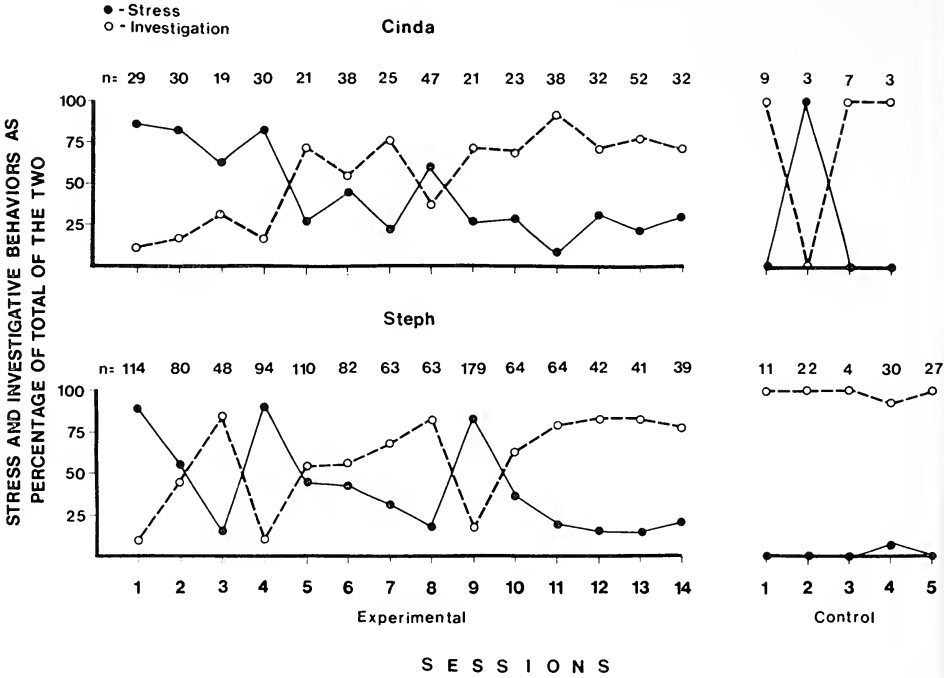
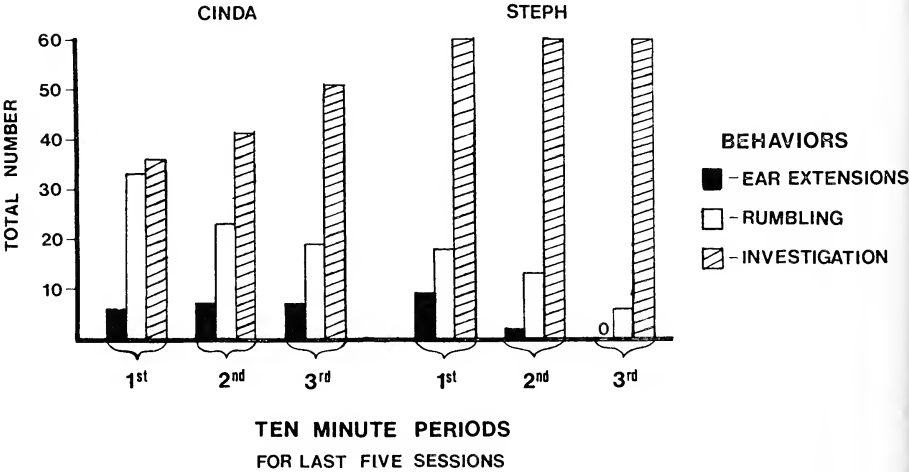
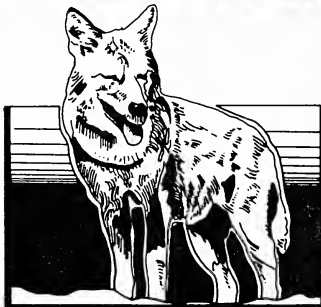
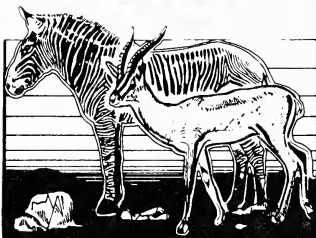
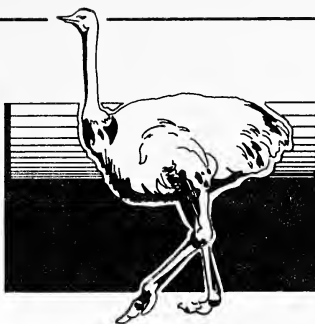


FIGURE 1 -- Comparison of changes in behavior during the course of the experiment shown by plotting the percentage of each of the total number of stressful and investigative behaviors combined.

FIGURE 2 -- Changes in certain behaviors during the course of a session. Data are from the last five sessions for each subject.





for your
captive
audience

Spectrum offers
a complete line of
High Quality
Food Products,
and we're proud of
the Professional Service
we give our Customers.

Zu/Preem.

NEBRASKA BRAND

BALANCED NUTRITIONAL DIETS
QUALITY ASSURANCE
ECONOMICAL FEEDING PROGRAMS

EXCLUSIVELY DISTRIBUTED BY



Animal SPECTRUM Inc.
5801 Locust Street
Lincoln, Nebraska 68516

Phone Toll Free 1-800-228-4005
In Nebraska phone 402-488-6492

ADJUSTMENT PROCESS OF AFRICAN ELEPHANTS TO A NOVEL SITUATION, Continued

the frequency of rumbling decreased and ear extensions remained about the same. In contrast, Steph's investigative behaviors remained consistently high with very little change over the course of the three periods, and ear extensions showed a small decrease by the third period. Like Cinda, Steph showed a steady decrease in rumbling.

DISCUSSION

In both elephants the predominance of behaviors indicative of stress and investigation reversed with repeated exposures. The only exceptions to this trend are caused by the shortened test sessions, the use of motor patterns (pawing) rather than context; i.e. pawing as a part of dusting process (Douglas-Hamilton, 1975), and presence of a strange observer. The adjustment process was only reliably shown by the comparison of proportion of behaviors indicative of investigation and stress. Ear extensions, agitated locomotion or ramming the bars occurred at least once in all the sessions, so behaviors indicative of stress did not completely disappear. The number of investigative behaviors varied with the sessions. On some days, the elephants were more active than others. Nonetheless, by using the predominance of these two categories of behavior, it is clear that the subjects exhibited a stable adjustment to the novel enclosure by the ninth or tenth session. Also each elephant showed a difference in its response to the novel enclosure within a session and with repeated testing. This difference in these responses may have been due to a dominant relationship. Steph has always been considered dominant over Cinda by the zoo staff.

The determination of an elephant's adjustment to a novel enclosure using the proportional standard described here may be of use to other researchers as well as to handling of the elephants by zoo keepers.

ACKNOWLEDGEMENTS

I especially want to thank Dr. William M. Langley of the Wichita State University Biology Department for his inspiration and guidance. Grateful appreciation is also extended to Mr. Ron Blakely, Director, Mr. Ken Redman, General Curator, and Dr. Gary Greenberg, Curator of Research, at the Sedgwick County Zoo for all their cooperation and assistance. Furthermore, I want to express my gratitude to all the animal keepers and observers who assisted me with the elephants, most notably Steve Kingswood and Terry Lincoln.

REFERENCES

- Adama, J., and Berg, J.K., 1975. Behavior of female African elephants (*Loxodonta africana*) in captivity. *Applied Animal Ethology* 6: 257-276.
- Douglas-Hamilton, I. and Douglas-Hamilton, O., 1975. *Among the Elephants*, Viking Press, New York.
- Hediger, H., 1968. *The Psychology and Behavior of Animals in Zoos and Circuses*. Dover, New York.
- Kuhme, W., 1962. Ethology of the African Elephant. *International Zoo Yearbook* 6: 113-121.

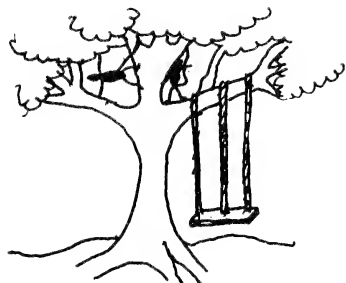


THE ZOO SYSTEM

BY ALAN SHARPLES , ATLANTA ZOO



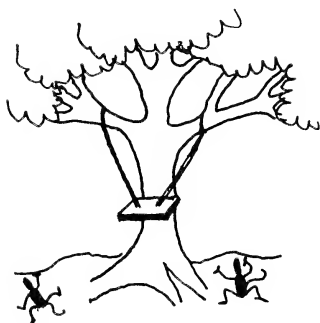
1. WHAT THE CURATOR SUGGESTED



2. WHAT THE DIRECTOR APPROVED



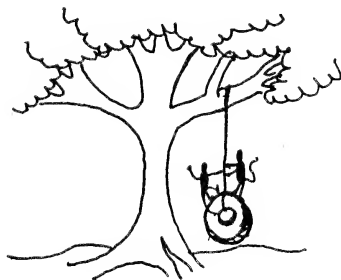
3. WHAT PURCHASING ORDERED



4. WHAT WAS DELIVERED

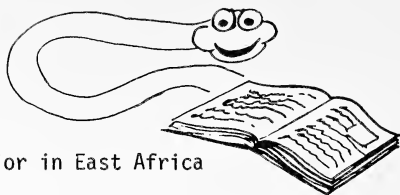


5. AS MAINTENANCE INSTALLED IT



6. WHAT THE KEEPER REQUESTED

Book Review



Portraits In The Wild - Animal Behavior in East Africa Second Edition

By Cynthia Moss
University of Chicago Press
5801 S. Ellis Ave., Chicago, IL 60637

*Review By Mary D. Keiter
Sr. Veterinary Technician
Woodland Park Zoological
Gardens, Seattle, WA*

Cynthia Moss has spent the last 12 years in East Africa, eight of which have been spent researching elephant behavior in Amboseli National Park, and much of the information she collected during that time is included in the chapter on elephants.

Concentrating on the following species - African elephant, giraffe, black rhino, zebras, antelopes, baboons, the big cats and the spotted hyena - she documents the various field studies which have been carried out comparing the results of the various researchers. She also discusses the various differences among species of the same genus (e.g. zebras, baboons) and goes into considerable detail regarding the social organization, behavior and general ecology of each. The information on social organization, reproductive and maternal behavior is of particular interest and would serve as an excellent source of reference in captive management.

An extensive bibliography of field studies is also included.

The information is presented in a most readable manner, is comprehensive, and illustrated with numerous photographs showing behavioral or ecological facets of each animal.

Information Please

INFORMATION REQUEST

I have been in charge of two brown bear cubs at the Alaska Zoo in Anchorage for the last 9-10 months. They are estimated to be 14 months old. My problem concerns their coats. They have had short coats since their arrival and I was worried last winter as it does get cold up here. My director suggested an internal parasite test which came out negative. A veterinary technician suggested ectoparasites, but this seems to be negative also. I believe another possibility to be their captive environment. They have a wood house which they play around and sleep in, a large metal jungle gym, and sand flooring. Their entire outside area is covered. Their short hair is most noticeable on the same general area (shoulders and hips) of both the male and female.

My question is: Are there any zoos with bear cubs having hair growth problems due to environmental conditions? If so, how was the problem corrected? I would appreciate any information on this subject. Send information to: Mr. Tracy Lingnau, 8000 e. 4th, Apt. B, Anchorage, AK 99504.

A UNIQUE ZOO IN CHIAPAS, MEXICO

By

John P. Ehrenberg, MD. MsC
Dept. of Immunology & Infectious Diseases
Johns Hopkins School of Hygiene & Public Health
Baltimore, MD

In 1976 I had the privilege of working in the state of Chiapas on my first assignment as a newly graduated physician. This state, which borders Guatemala in the south, is predominantly mountainous, except for an area known as the Lacandon jungle, a central and a coastal plain with scattered pockets of rain forests on its volcanic mountain slopes.

It is the main center of a profitable timber and coffee industry as well as having a large number of hydroelectric power plants which supply a good portion of the country with electrical energy. Recently, it has become the focus of public attention for its large oil resources. It is needless to point out the tremendous impact these changes have had upon the state's ecology. Despite this, policies which regulate the impact of these changes upon the ecology are poorly defined and implemented, rendering work related to conservation almost impossible.

It is within this context that I would like to give the reader a brief account about the efforts of Miguel Alvarez del Toro, a man who is desperately trying to save a small portion of our heritage.

Not long after our arrival in Chiapas, my wife and I discovered a truly unusual phenomenon for Latin America: a magnificent, unpretentious zoo in Tuxtla Gutierrez, the state's capital, exhibiting exclusively local fauna.

At that time, the institute for which I was working was conducting an epidemiological study on the occurrence of yellow fever in the state. Researchers were sent into the field to collect monkey carcasses in order to assess the presence of the selvatic form of this viral infection. In the process, live monkeys were also caught and referred to the institute for examination. My wife and I adopted one of the young specimens which we thought would be better off at the Tuxtla Gutierrez zoo. Through this incident we had the opportunity of meeting Alvarez del Toro, founder and director of the zoo, as well as his family, also active members of the zoo's team.

We were very impressed by this family's extraordinary efforts in running the zoo against all odds and with a tight government budget. We soon found out about their other equally important activities. Alvarez del Toro is also founder of a regional botanical garden, a small aquarium and a small but significant museum of natural history, all exhibiting exclusively regional fauna and flora. He is an accomplished writer, author of several books describing the fauna of the state and, more importantly has been very active in the field of education.

In 1981 we traveled again to Chiapas and found that the old zoo had been transferred to a 100 hectar virgin rain forest located in the outskirts of Tuxtla Gutierrez. How Alvarez del Toro managed to rescue this forest in the face of a devastating deforestation campaign remains a puzzle to me. The new animal enclosures are impressive, especially the huge aviary harboring a flock of approximately 30 scarlet macaws. Howler monkeys (Alouatta villosa) roam free in the park and have started to breed. His

A UNIQUE ZOO IN CHIAPAS, MEXICO, Continued

breeding colony of spider monkeys (Ateles geoffroyi) is probably the largest in captivity. He has successfully maintained and bred Baird's tapirs (Tapirus bairdii), now extremely rare in the wild. The zoo maintains, among its rare specimens, one Horned Guan (Oreophasis derbianus), which is possibly on the verge of extinction, a harpy eagle, also rare in the wild, and a small herd of manatees.

All enclosures were designed and built in such a way as to prevent destruction of the forest. Alvarez del Toro acknowledges that this was achieved with the support he received from the state's governor, who has since left office.

Unfortunately, this has not always been the case in the past and may not be so in the future, especially considering the present state of the Mexican economy. Alvarez del Toro is now facing the immense task of maintaining the zoo for future generations. Entrance fees, that important source of revenue of national zoos, is unavailable since it is against government regulations for public zoos to collect any fees. Since the region is basically an agricultural economy, any source of private donations is virtually nil. The nearest area where the economy is more in line for this type of support is Mexico City which is approximately 1600 Km away. In many instances, Alvarez del Toro has had to provide money out of his own pocket to make ends meet.

Zoos are probably the last hope for the survival of certain animal species. This is especially apparent in Chiapas where so much damage has been inflicted on the ecology of the region. It is sad to see the jungles, mountain rain forests, estuaries and temperate forests disappear with little or no opposition. My wife and I have witnessed these changes taking place year after year. Because of these changes, it is very important that Alvarez del Toro's work as a conservationist and educator receive our support.

In no way do I pretend to give a detailed description of the zoo, the aquarium, natural history museum and the botanical gardens, all of which were conceived by Alvarez del Toro and certainly make a trip to Tuxtla Gutierrez worthwhile. Instead, I would like to give the reader an idea of the difficulties encountered by zoos, conservationists, naturalists and the entire field of ecology-related institutions and workers in a developing country such as Mexico.

Being a layperson in this field, I would like to refer the reader to Alvarez del Toro himself for any further information about the zoo and adjoining facilities. He may be contacted at the address below:

Mr. Alvarez del Toro
Apartado Postal No. 6
Tuxtla Gutierrez, Chiapas
Mexico

from the President

Dear Members,

We can all be impressed with the efforts of Mr. Alvarez del Toro aimed at preserving the natural heritage of his country, and in educating his countrymen in the needs of conservation. We share the dream with him, that even one person can influence the fate of our ecosystem.

A UNIQUE ZOO IN CHIAPAS, MEXICO, Continued

One of the ways in which we as individual AAZK members may be able to assist Mr. Del Toro in his efforts is by donating zoological literature to this zoo. Please keep this in mind and consider contacting Mr. del Toro about the needs of his library.

Thank you for all you are doing for our wildlife.

Sincerely,

*Patricia E. Sammarco
President*

Zoo Keeper



BELIEVE IT OR NOT!

By

*Bernie Feldman, Keeper
Miller Park Zoo
Bloomington, IL*



Have you ever wondered how to get rid of pesty mice from your beautiful tropical exhibit without using poisons and traps? We at the Miller Park Zoo in Bloomington, IL came up with an answer.

Our large tropical rain forest exhibit has always been invaded seasonally by mice. In the fall as well as in the spring, the mice enter the tropical exhibit by way of the dirt. They tunnel under the building and come up inside the exhibit to find warmth, food and shelter. After digging them out, hosing them down, puffing poison down their holes and still seeing them alive in the exhibit, we became frustrated. They got so bad at times they began eating some of our plants! At times the smell of mice in the tropical rain forest was very noticeable, especially after a watering of the plants.

Then we had a brainstorm! We decided to sprinkle rat urine soaked bedding, in the form of cedar shavings, along the inside perimeter wall of the entire exhibit in the fall of 1982.

Since mice and rats are natural enemies, the scent of rats in the tropical exhibit would repel the mice from entering the exhibit by way of the dirt. The smell of the rat urine soaked bedding never was noticeable to any great extent and after a few water sprayings for the plants, the bedding blended well and degraded well into the soil.

After one month of placing rat urine soaked bedding along the inside perimeter wall of the exhibit, we could find no mice or any signs or evidence of mice! We were delighted that we actually initiated a mouse control program in our tropical exhibit using natural means.

As of this writing in the spring of 1983, there has been no occurrence of mice at all in our tropical rain forest exhibit. The rat urine soaked bedding is successful in keeping mice out of the exhibit. We also have poison traps set up outside the exhibit to help discourage further mouse invasions. Try it in your favorite tropical exhibit and see the results, naturally! Believe it or not!



THINK Safety!

*By Jill Grade, Keeper
Busch Gardens, Tampa, FL*

I am still hoping to receive contributions for this column as stated in my last article (May '83 AKF, page 165). Send cartoons, tips, articles, etc. on health and safety in your zoo to me, c/o Busch Gardens Zoo, P.O. Box 9158, Tampa, FL 33674. Though input on safety techniques in animal handling will be valuable to many of us, contributions need not be directly related to animal care. Safety should be a state of mind affecting all aspects of our workday activities.

Here at Busch Gardens, a number of safety precautions have been implemented which have nothing to do with animal contact. For instance, more than half a dozen mirrors have been strategically placed along service roads where blind spots occur. Protrusions on the legs of new breakroom benches have been removed. Goggles and gloves are provided for use when handling dangerous chemicals. Steel mesh gloves are mandatory when cutting food in our kitchen. Safety strips (sandpaper-like adhesive strips) are applied to all slick surfaces. Endurance tests are given by our Personnel Department to make sure keepers are physically able to handle their work assignments with minimal safety risk.

My personal pet peeve is protrusions. Having worked among large numbers of wire bird cages for many years, I know the meaning of stray wires. A protruding piece of innocent-looking chicken wire can make a gash requiring stitches--not to mention what it can do to our eyes, or the eyes of our charges. A long neglected nail point will eventually put a hole in somebody. Protruding bricks, boards, tree roots, etc. will eventually trip someone up when they least expect it.

Busch Gardens has also recently implemented a safety award program. The awards are in the form of scrip, which can be spent on food and gifts anywhere in the park. Each employee receives the scrip for every 30 days during which he/she works accident-free. This may or may not provide safety incentive, but the scrip does serve as a reminder, and any number and variety of safety award programs would serve as well. I'd be interested in any suggestions you'd have along these lines.

I am also looking for an AAZK safety slogan to put on small stickers for use as reminders in our zoos. THINK Safety! would serve the purpose, but something more tailored to AAZK or zoos would probably have greater impact.

In the meantime, THINK Safety!



A HANDMADE BLOWGUN DART: ITS PREPARATION
AND APPLICATION IN A ZOOLOGICAL PARK

By

Susan Barnard, Senior Keeper
Dept. of Herpetology
and

J.S. Dobbs
Atlanta Zoological Park, Atlanta, GA

Many remote injection devices for administering drugs to zoo animals eliminate stressful physical restraint for an animal and potential danger to the handler(s). Various gas- or power-charged devices¹ are commercially available, but these can be impractical at short distances and can cause muscle and bone injuries.²⁻⁴ A pole syringe⁵ is also available, but it is difficult to use because many animals learn to recognize the device and to react adversely. To minimize this problem, butane-powered darts have been mounted on an extension pole.² In addition, large quantities of a drug (up to 50 ml) can be administered in a single injection. For short-range delivery of drugs in lesser amounts with minimal trauma, the blowgun dart has proven beneficial. One commercially produced device⁶ is available in the United States. Aside from the initial expense of purchase, a continuing outlay is involved to replace items. Consequently, some investigators have reported the preparation and use of handmade blowgun darts that offer a variety of unique characteristics.^{3,4,7} Described herein is an additional blowgun dart design that offers further versatility for its users.

MATERIALS

For the production of a single dart:

- Two 3-ml sterile disposable syringes⁸
- Electric drill motor with 5.1cm (2 in) grinding stone
- Open flame (such as a candle)

Needle and collar:

- Disposable 18-gauge needle, 3.7 cm (1½ in) long⁸
- 1.3 cm (½ in) rubber tubing
- Scissors
- Silicone rubber sealant⁹
- Epoxy resin glue

Tailpiece:

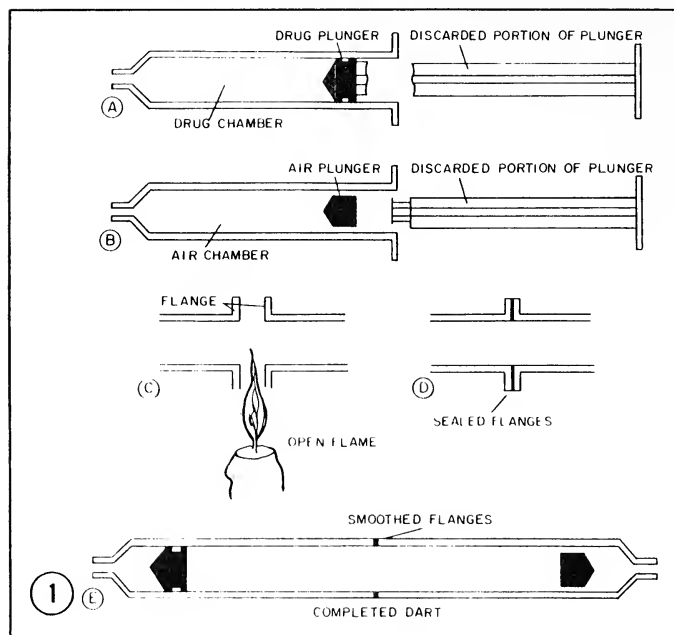
- One gauze sponge or polyester-braided, single-fold seam binding
- Gripper plier kit¹⁰
- No. 16 p eyelets¹⁰
- Sharp-pointed object (a disposable needle)

Extra:

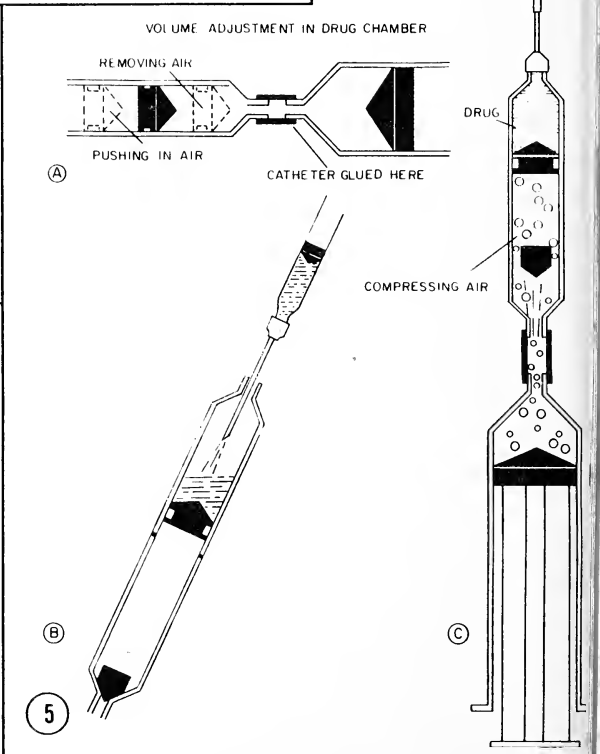
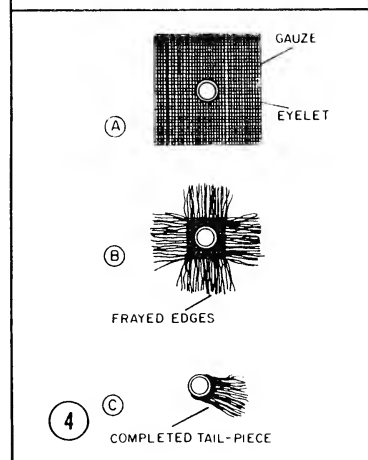
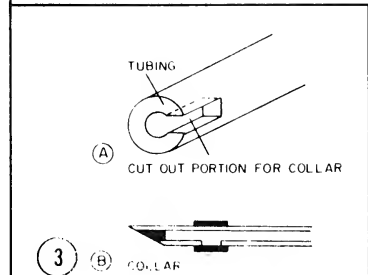
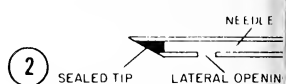
- 35-ml disposable syringe⁸
- Catheter, French size No. 14⁸
- 1.3-cm (½ in) polyvinyl chloride plastic pipe for blowgun
- K-75 sterile 3-way stopcock¹¹

Dart Preparation (Fig. 1)--Remove the plunger of a 3-ml syringe. Grind or cut off the plastic shaft, saving the rubber tip. Insert the rubber tip into the syringe barrel, which serves as the drug chamber (Fig 1A). Remove the plunger from a 2nd syringe and grind away the 2 rings around the rubber tip that provide the tight fit in the syringe barrel. Insert

A HANDMADE BLOWGUN DART: ITS PREPARATION AND APPLICATION IN A ZOOLOGICAL PARK, *Continued*



Figures 1 through 5 --
Diagrammatic representation of steps in the making of a blowgun dart



A HANDMADE BLOWGUN DART: ITS PREPARATION AND APPLICATION IN A ZOOLOGICAL PARK, Continued

this rubber tip back into the barrel, with the pointed end toward the syringe neck. It should move freely in the syringe barrel, which is now called the air chamber (Fig 1B). Heat and soften the flanges of both syringes with an open flame (Fig 1C). Push the flanges tightly together as the plastic begins to melt. Hold firmly and straight until cooled (approximately 1 minute) and the 2 chambers are joined (Fig 1D). Grind off the excess plastic material at the joined flanges until smooth (Fig. 1E). The union between the 2 barrels must be airtight. If it is not, silicone rubber sealant⁹ may be used around the joint. The sealant will not substitute for the melting process.

Needle Preparation (Fig 2)--About 1 cm from the tip of a needle of desired gauge and length, grind a hole in 1 side with the grinding stone. Seal the tip of the needle with silicone rubber sealant⁹ by placing the bevelled end of the needle into the sealant. Remove excess sealant and allow to solidify for about 12 hours.

Collar Preparation (Fig. 3)--The collar provides cover for the lateral opening in the needle. Cut out a 0.5 x 1.0-cm piece from the wall of a 1.3-cm ($\frac{1}{2}$ in) rubber tubing (Fig 3A). Run the needle through the sectioned piece of rubber longitudinally (Fig. 3B).

Tailpiece Preparation (Fig 4)--Cut a 4-cm² piece from the seam binding or a gauze sponge and fasten an eyelet in its center (Fig 4A). The use of epoxy resin glue applied around the circumference of the eyelet assures a firm bond. With a sharp object, fray the edges of the seam binding or the gauze patch (Fig 4B). Mold to make the tailpiece to suitable shape and cut off about 1.5 cm from eyelet (Fig 4C). Seam binding, used instead of gauze, has the advantage of maintaining its integrity after accidental wetting.

Blowgun Preparation--The blowgun is fashioned from a 112-cm piece of polyvinyl chloride plastic pipe. Smooth edges at each end. To provide better blowing efficiency, a mouthpiece can be fashioned by applying silicone rubber sealant⁹ at one end. Polyvinyl plastic pipes are flexible. Therefore, most cut sections of 112 cm will have a slight curve, which, when turned to the upward position, will counteract the downward trajectory of the dart. Using a 3-way stopcock or a small amount of epoxy resin glue, fasten 1.5 cm of a No. 14 French catheter to the nozzle of a 35-ml syringe. Insert the nozzle of the drug chamber into either the female adapter of the stopcock or this collar. Regulate the desired volume by either removing or pushing in air (Fig 5A). Introduce the drug with another syringe (Fig 5B), and place the modified needle on the neck of the drug chamber. Now attach the 35-ml syringe with catheter attached to the air chamber of the dart. Hold the dart upright and compress as much air as possible into the air chamber of the dart (Fig 5C). Quickly remove from the dart and place the tailpiece on the neck of the air chamber. The sliding rubber tip of the air chamber will snap against the aperture of the air chamber, sealing in the compressed air. The dart is now ready to use.

Within a range of 8 m, the blowgun is highly accurate. The range may be extended to 12 m with a slightly longer gun and with increased practice. The blowgun dart has been used successfully and with minimal trauma to give injections to many species of zoo animals. The dart's variable drug capacity makes it versatile for routine use. The interchangeable tailpiece of this device gives it a distinct advantage over other handmade blowgun darts because a wet, nonusable tailpiece can be replaced with another one. Further, as described, this blowgun dart is inexpensive to construct and uses common, easily obtainable materials.

A HANDMADE BLOWGUN DART: ITS PREPARATION AND APPLICATION IN
A ZOOLOGICAL PARK, Continued

1. Palmer Chemical Co & Equipment, Douglasville, GA; Zoo-Lu Arms of Omaha, NE; Paxarms Ltd., Timaru, New Zealand.
2. Fletcher KC, Boyce L, Florence D; Butane powered injection by pole syringes. J Zool Anat Med 10:106-112, 1979.
3. Haigh JC, Hopf HC: The blowgun in veterinary practice: Its uses and preparation. J Am Vet Med Assoc 169:881-883, 1976.
4. Ruedi D: The use of the blow-pipe in the Basel zoological gardens, in Proceedings, Am Asspc Zoo Veterinarians, Honolulu, HI, 1977, pp 1-6.
5. Pole syringe, Med-Tech Industries, Elwood, Kansas
6. Telinject USA Inc. Encino, CA
7. Warren RJ, Schauer NL, Jones JT, et al: A modified blow-gun syringe for remote injection of captive wildlife, J Wildl Dis 15:537-541, 1979.
8. Mono-ject, Sherwood Medical Industries Inc, St. Louis, MO
9. Dow-Corning Corp, Midland, MI
10. Scovill, Spartanburg, SC
11. Pharmaseal Inc, Toa Alta, Puerto Rico.

(Editor's note: The preceding article was sent to AKF for publication by Susan Barnard. It was originally published in the Journal of the American Veterinary Medical Association, Vol. 177, No. 9, 1980 and is reprinted here with the permission of the author and the editor of JAVMA.)



DEVELOPMENT OF CAPTIVE-BORN, MATERNALLY REARED SLOTH BEAR CUBS

Heath, D.C., Washington Park Zoo, 4001 SW Canyon Road, Portland, OR 97221.
Mellen, J.D., Washington Park Zoo, 4001 SW Canyon Road, Portland, OR 97221.

Sloth bears (Melursus ursinus) are unique among ursids in that they are primarily mymecophagous and in that the female carried the young on her back. The development of two male sloth bear cubs was examined from birth to one year of age at the Washington Park Zoo, Portland, OR. From birth through three months of age, the female and cubs were monitored via audio and video equipment. Beginning in the fourth month, percentage of time spent in various activities for all three bears was determined by direct observation. Fixed positions in nursing and riding appeared to have been established early in the cubs' development. Each cub was observed to nurse from or ride on only "his" area of the female. Most agonism between the cubs appeared to be associated with conflict over these two behaviors and positions. Social play of sloth bears was compared to that of American black bears. In addition, the signal value of various ear postures was not as apparent in sloth bears; they instead relied on an assortment of muzzle positions to communicate.

Author's note: This abstract describes a paper presented at the 6th International Bear Conference in Grand Canyon, AZ in February 1983. Reprints of this paper are available by writing the authors at the above address.

Those of you who are interested in becoming members of the IBA should contact Dan Heath, WPZ, Portland, OR. Hopefully the August AKF will contain a description of IBA, its functions and members and membership information.



Legislative News

Compiled by Kevin Conway
AAZK Legislative Coordinator

WYOMING TOAD PROPOSED AS ENDANGERED

An extremely rare subspecies of amphibian, the Wyoming toad (*Bufo hemiophrys baxteri*) has been proposed by the U.S. Fish and Wildlife Service for listing as Endangered. This toad was formerly abundant throughout the Laramie Basin, but currently no populations are known to exist. Although the cause of its steep decline is not yet determined, habitat alteration and the use of various biocides may be significant factors.

The Wyoming toad was discovered by Dr. George T. Baxter in 1946. It is the only toad in the Laramie Basin, and is thought to be a relict population left behind as glaciers receded. Since its discovery, Dr. Baxter has taken University of Wyoming students during the summers to observe the toad, and known breeding sites have been visited regularly for more than 30 years. Dr. Baxter's field notes indicate that the toad was common in the Laramie Basin through the early 1970's. Since 1975, however, researchers have noted a decline in the population. Toads became extremely rare between 1976 and 1978, and in 1979 none were seen although one was heard calling.

An intensive survey conducted throughout the Laramie Basin in 1980 resulted in the discovery of one small population on private land in Albany County, southeastern Wyoming. The population occurred within a 40-acre area and was estimated to consist of no more than 25 individuals. Surveys in 1981 revealed only one male and one female at the site, and no toads were located in 1982.

---Endangered Species Technical Bulletin
Vol. VII, No. 2

RECOVERY PLANS FOR LAYSAN DUCK, SONORAN PRONGHORN APPROVED

The Laysan duck (*Anas laysanensis*) is a small, dark brown duck endemic to Laysan Island in the northwestern or leeward Hawaiian Islands. Severe habitat damage suffered in the early 1900's almost resulted in this duck's extinction, and in 1967 it was officially listed as Endangered. At times, it has been considered one of the rarest ducks in the world.

Laysan is a 1,020-acre island about 709 miles northwest of Kaua'i, and is now part of the Hawaiian Islands National Wildlife Refuge. In 1890, prior to establishment of the refuge, Laysan was leased to a private company for guano mining. Later, in 1903 or 1904, rabbits were introduced on the island at least in part to provide a more varied diet for the workers. After the departure of the miners in 1910, the rabbits were no longer held in check and their numbers exploded, resulting in the rapid devegetation of the island. The ensuing sandstorms, together with a lack of food, led to the extinction of the Laysan millerbird (*Acrocephalus familiaris*), rail (*Porzana palmeri*), and honeycreeper (*Himatione sanguinea freethi*). The habitat degradation also brought the Laysan finch (*Telespyza cantans*) and duck to the brink of extinction.

After the severity of the impact was recognized, a campaign to eradicate the exotic rabbits was started. They were finally eliminated during the expedition of the U.S.S. Tanager (A U.S. Navy minesweeper) in 1923. The island then revegetated both naturally and through plants introduced by the Tanager expedition. Current habitat conditions are thought to approxi-

LEGISLATIVE NEWS, Continued

mate the situation prior to introduction of the rabbits, except for the elimination of several bird and plant species and the establishment of a few exotic plants. Estimates of the Laysan duck population on the island have fluctuated significantly from 20 in 1923 to about 510 in July 1980, although different survey techniques could account for a large part of the variation. As recently as 1973, only 25 ducks were counted at the island's central, salt-water lagoon; 162 were seen the previous year. The recovery plan does emphasize that the population is cyclic and lows will occur. It is thought that the carrying capacity of Laysan Island may be 500-600 ducks.

The prime objective of the recovery plan are to insure the protection of the Laysan duck's natural island habitat and to improve the status of the species from Endangered to Threatened. Because of the limited habitat of Laysan Island and its vulnerability, the duck probably will always be considered a Threatened species. Its continued existence will depend on two factors: continued complete protection of Laysan Island and a viable captive propagation program.

Another important part of the plan is a coordinated captive propagation effort to maintain a healthy stock for reintroduction on Laysan if the wild population becomes extinct. There are many zoos and breeding farms which have Laysan ducks in captivity, and propagation has been highly successful. The plan calls for a minimum of four breeding farms with at least 20 birds each. A bird exchange program among the facilities is encouraged to prevent inbreeding and to maintain their genetic health.

A second Recovery program approved by the U.S. Fish and Wildlife Service involves the Sonoran pronghorn (*Antilocapra americana sonoriensis*). The Sonoran pronghorn is one of the few large mammals recognized as being endangered in the U.S. today. The drying of the major rivers and overgrazing have significantly altered Sonoran pronghorn habitat in southwestern Arizona by the 1930's and are the probable cause of the subspecies' decline.

Unregulated hunting undoubtedly contributed to the animal's initial decline. However, with the protection that has been provided for the past 40 years, the pronghorn should have recovered if hunting was indeed a primary factor.

Adequate records exist that indicate pronghorn antelope were distributed throughout southern Arizona prior to 1900. However, the historic distribution on the Sonoran subspecies is not certain. It is presently found in Arizona on the Cabeza Prieta National Wildlife Refuge, Organ Pipe National Monument, and the Luke Air Force Gunnery Range. It may also occur on portions of Papago Indian Reservation. In Mexico, the subspecies is believed to be confined to the northwestern part of the State of Sonora.

Data compiled by the Arizona Game and Fish Department over the past 10 years indicate a pronghorn population in Arizona of more than 50 but probably less than 150 individuals. The population of Mexico is believed to number between 200-350. Economic exploitation of habitat (grazing and agriculture) and poaching are thought still to be causing numerical and habitat losses in Mexico.

The taxonomy of the subspecies is poorly understood as little taxonomic material is available. Biological data concerning even basic natural

LEGISLATIVE NEWS, Continued

history information such as reproductive capabilities, water requirements, food habits, and home range are not known.

RECOVERY PLAN

The objective of the Sonoran Pronghorn Recovery Plan is to maintain existing population numbers and distribution of the animal while developing techniques to increase both. The plan establishes as a goal the maintenance of an average of 300 animals for a 5-year period before delisting of the subspecies could be considered.

A major problem facing the recovery of the Sonoran pronghorn is that the recovery methods employed in Mexico may have to be quite different from those used in Arizona. In the U.S., most of the habitat where the pronghorn is found is reasonably secure, controlled either by the National Park Service, the Fish and Wildlife Service, or the Department of Defense. However, in Mexico the habitat occupied by the pronghorn is rapidly deteriorating and a second comprehensive plan may have to be developed and implemented by Mexico if the subspecies is ever to completely recover.

A second problem is that present knowledge indicates no clear means to increase either population densities or range. While range extensions through habitat management and/or transplant may offer potential as a means of increasing the population, no data exist describing suitable transplant sites, capture methods, or the number of animals that could be removed safely from the existing population.

The plan calls for continuous compilation of data on the existing U.S. population and for taxonomic research. It also provides for assistance to the Mexican government in establishing and implementing a management plan for the pronghorn population in Mexico.

Two employees of the Albuquerque Regional Office (USFWS) recently met with representatives of the Arizona Game and Fish Department and Luke Air Force Base to initiate a study on Sonoran pronghorn ecology. The study plans include capturing and radio-collaring six to eight animals on Cabeza Prieta National Wildlife Refuge.

1983 APPROPRIATIONS

The Department of the Interior's appropriation bill was signed into law by President Reagan on 30 December 1982. The budget for the Endangered Species Program totals over \$20 million; Congressional add-ons included in this total will provide \$2 million for Section 6 State grants, \$216,000 for peregrine falcon recovery, \$100,000 each for California condor and whooping crane telemetry, and \$987,000 for law enforcement. Included elsewhere within the Service's 1983 appropriations was an additional \$150,000 for implementation of the Western Hemisphere Convention.

Funding from the Land and Water Conservation Fund was appropriated to purchase habitat which will benefit the following listed species:

American crocodile	Crocodile Lake NWR	\$2,766,000
Bald eagle	Bear Valley NWR	812,000
Kirtland's warbler	Ogemaw State Forest, MI	500,000
West Indian manatee	Chassahowitzka NWR	500,000
Plymouth red-bellied turtle	Massasoit NWR	275,000



Chapter

*By Patti Kuntzmann
Coordinator for Chapter Affairs*

MOORPARK COLLEGE CHAPTER AAZK

Their first meeting held in May was quite a success due to speakers Dean Harrison and Randy Gallant who presented "Modern Dinosaurs-- A Closer Look at Reptiles and Their Care". Dean and Randy brought a unique collection of animals including a Cuban Knight Anole, Green Iguana, Salvator Monitor Lizard, Bengal Monitor Lizard, Burmese Python, Indian Python and the star of the show, a 17-foot Reticulated Python. Reptiles at the Exotic Animal Compound in Moorpark will be looked upon with new perspective after such an enlightening discussion.

Newly elected officers for the Moorpark Chapter are:

President.....Carmel Stanko
Vice Pres.....Andrew Silvers
Public Relations...Dawn Lane
Sec/Treas.....Mollie Hogan

New officers for the Bronx Zoo Chapter of AAZK are:

President.....Angelo T. Arena
Vice-Pres.....Pat Thomas
Treasurer.....Bob Edington
Corres. Sec.....Margaret Price
Record. Sec.....Regina Keenan

The Bronx Zoo Chapter made one change in their local by-laws dealing with annual dues. They are now \$10.00 per year.

News

KANSAS CITY ZOO CHAPTER

The Keepers at the Kansas City Zoo have reorganized and revitalized their chapter and are currently working at recruiting members and establishing programs. They recently had a pancake breakfast, have a continuous paper and aluminum drive and are in the process of organizing a fireworks stand for July.

Newly elected officers are:

President.....Melissa Svoboda
Vice Pres.....Mark Kabak
Secretary.....Dee Wolfe
Treasurer.....Terry Elder
Newsletter.....Bob Thornton
Programs.....Mark Kabak
Fund-raising.....Terry Elder



ATTENTION--A note to those chapters or individuals who helped support the World Wildlife Fund's plan to purchase endangered rainforest land in Columbia, South America. The AAZK Office was recently advised that Russel Train, Executive Director of WWF was recently in Columbia and has completed the purchase agreement for the land known as La Planada. We will keep you updated as information on this project becomes available.



Conference..... 83

URGENT...HOTEL RESERVATION REQUEST FORM...PLEASE READ!

If you would like to share a double room with a specific person you must include that person's full name on your Hotel Registration Request form. The University City Holiday Inn will not match anyone up with another person at random. You must provide the Holiday Inn with the full name of the person with whom you want to share a double room. Otherwise you will not be paired up with a roommate by the Holiday Inn and will have to pay for a single room (\$50.00).

If you do not know a person with whom you would like to share a double room, the Philadelphia Chapter-AAZK will take the responsibility of preparing a list from the reservation forms and will then match you with a roommate. You must tell us on your reservation form whether the roommate is to be male or female. This will be the only basis for pairing people up in double rooms. Any problems which occur are to be addressed to the Philadelphia Chapter-AAZK during the conference. Be sure your full name and address are on your reservation form.

PLEASE REGISTER EARLY so that the Philadelphia Chapter will have enough time to match people and get the reservation forms back to the hotel so that your reservation can be confirmed.

DAY RATES

Day rates are available for the conference. The fees are as follows:

October 2nd	\$5.00 Icebreaker
October 3rd	\$20.00 Papers
October 4th	\$20.00 Day at the Philadelphia Zoo
October 5th	\$20.00 Papers/Brandywine Zoo
October 6th	\$30.00 Papers/Banquet Auction
	\$20.00 Banquet/Auction

Reservations for the banquet must be in by September 29, 1983--NO EXCEPTIONS. Please use the following form to register for individual events. Send the form to: Gene Pfeffer, Conference Registration/Day Rates, Philadelphia Zoo Chapter AAZK, 34th St. & Girard Ave., Philadelphia, PA 19104.

INDIVIDUAL EVENT REGISTRATION

NAME: _____	Oct. 2nd	\$5.00 Icebreaker
ADDRESS: _____	Oct. 3rd	\$20.00 Papers
CITY: _____ STATE/PROV _____	Oct. 4th	\$20.00 Phila. Zoo
ZIP/POSTAL CODE: _____	Oct. 5th	\$20.00 Papers/ Brandywine Zoo
PHONE NUMBER: () _____	Oct. 6th	\$30.00 Papers/Banquet/ Auction
DAY(S) ATTENDING: _____		\$20.00 Banquet/Auction

TOTAL FEES ENCLOSED: _____

VEGETARIAN? _____ YES _____ NO

AAZK DISCOUNT TRAVEL INFORMATION FOR NATIONAL CONFERENCE '83

AAZK Administrative Secretary Dolly Clark has made arrangements with AIRCORG, American-International Reservations Corporation, to provide special, discounted airline tickets to AAZK members and their families traveling to the National Conference in Philadelphia October 2-6, 1983.

AIRCORG is one of the largest bulk purchasers of regularly-scheduled airline tickets serving associations and organizations such as AAZK. They deal only with the largest and most reputable of major, regularly-scheduled airlines. AIRCORG will offer AAZK members and their families regularly scheduled transportation to Philadelphia at a price 20% below the standard First Class Fare, 30% below the standard Coach Class Fare, and 10% below the Standard Super-Saver Fare. Whenever a major airline "promotional price war" breaks out in a specific marketplace (e.g. the present Coast to Coast marketplace) for the travel dates of the AAZK convention, AIRCORG, if not already lower in price, shall either discount the lower fare where their bulk purchase suppliers (carriers) permit them to do so, match the lower fare, or release the reservation entirely. The choice of options shall be left to the member involved.

In addition, on Super-Saver Fares, AIRCORG guarantees that, as long as members meet the standard super-saver length of stay requirements, they will not be subject to super-saver "closeouts". This means that super-saver seats are normally limited to a certain percentage of all seats on any given flight, but for the period of the 1983 AAZK Conference, super-saver limitations per flight will be waived for members and their families.

AIRCORG has set up a toll-free numbers for AAZK members to use when making their reservations. Please see following page for this number as well as a listing of the cities from which AIRCORG can make travel arrangements for the Philadelphia Conference.

Under our arrangement with AIRCORG, AAZK is not required to guarantee the purchase of a minimum number of seats. Additionally, no cancellation fee will be charged members provided that such requests for refunds are received by AIRCORG in writing, certified mail, receipt requested. Members have the option of deciding the date, times of travel and length of stay. Requests for flight changes and dates of departure will be honored, without additional charge by AIRCORG, subject to AIRCORG's purchased bulk seat availability. Carriers allow one child under 2 years of age, who does not occupy a separate seat, to accompany a full fare passenger free of charge. Children's fares will be quoted upon request. Members making reservations through AIRCORG will receive their tickets no later than two weeks prior to departure.

We hope that these special travel arrangements made by AAZK National Office will assist you in making the trip to the Philadelphia Conference. If member response to this type of arrangement is satisfactory, we hope to be able to use AIRCORG's services for future conferences.



SAVE ON AIR COSTS



Lower than Excursion or Super-Saver fares!

As the official convention travel coordinator, **Aircorp** has established special convention airfares, on regularly-scheduled airlines, which are *lower than supersaver and lower than group rates.*

These airfares are not available to the general public and will be offered only to those participants booking reservations through Aircorp.

Call the airlines, call your Travel Agent,

then call **Aircorp**!

800-526-0110 and In N.J. Call 201-488-9330!

Discounted air service to the AAZK 1983 Philadelphia Conference is available from the following cities:

Albuquerque		
Amarillo		
Atlanta		
Austin	Cincinnati	
Baltimore	Colorado Springs	
Baton Rouge	Corpus Christi	McAllen
Beaumont	Dallas	Memphis
Billings	Denver	Midland-Odessa
Boston	Detroit	Milwaukee
Brownsville	El Paso	Minneapolis-
Burbank	Grand Junction	St Paul
Casper	Grand Rapids	Nashville
	Green Bay	Ontario, CA
	Houston	Phoenix
	Kalamazoo-	Portland
	Battle Creek	Rapid City
	Kansas City	Reno
		Salt Lake City
		San Antonio
		San Diego
		San Francisco
		San Jose
		Seattle-Tacoma
		Shreveport
		Lafayette
		Laredo
		Lansing
		Las Vegas
		Los Angeles
		Lubbock
		Tucson
		Washington, D.C.

1983 AAZK NATIONAL CONFERENCE REGISTRATION FORM

Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

CONFERENCE REGISTRATION

NAME: _____ AAZK MEMBERSHIP STATUS & FEE:
ADDRESS: _____ Member or Spouse.....\$50.00
CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00
ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
(After 15 August, 1983)
PHONE NUMBER: () _____
ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____
AREA OF INTEREST _____
WILL YOU BE SUBMITTING A PAPER? YES NO
(\$15.00 will be refunded from registration fee upon acceptance of paper)
NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____
VEGETARIAN? YES NO. If YES, Special Instructions _____

One-Day Rates for individual conference events are available. Contact Gene Pfeffer for details.

TRANSPORTATION _____ (car, plane, etc.)

PLEASE MAKE THIS CHECK PAYABLE TO: "PHILADELPHIA ZOO CHAPTER-AAZK". THE DEADLINE FOR REGISTRATION IS MONDAY, AUGUST 15TH, 1983.

HOTEL RESERVATION REQUEST

University City Holiday Inn, 36th & Chestnut Streets
Philadelphia, PA 19104

ORGANIZATION: _____

DATES OF CONFERENCE: _____

PLEASE CHECK BELOW THE TYPE OF ROOM YOU WISH TO RESERVE:

_____ SINGLE \$50.00 DAILY
(one person)

_____ TWIN/DOUBLE \$56.00 DAILY
(two persons)

Room Tax - 6%

\$6.00 charge extra, each person over
two in a room

ARRIVAL DATE _____ TIME _____ DEPARTURE DATE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TOTAL NUMBER OF NIGHTS IN HOTEL: _____

IF YOU WISH TO BE MATCHED WITH A ZOOKEEPER ROOMMATE, YOU MUST GIVE THAT PERSON'S FULL NAME: _____

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.

KEEPER DATA SURVEY

(Editor's Note: All Keepers who are members of AAZK are asked to give this survey form to a Keeper who is NOT a member of AAZK requesting that they fill it out and return it to: Mary Slaybaugh, Co-Coordinator for the Keeper Data Survey, 1916 Gillespie, San Antonio, TX 78212. Please have them indicate at the top of the survey that they are not currently an AAZK member. All AAZK members are asked to complete the survey found on Page 199 of the June 1983 issue of AKF.)

Personal information: Name (optional) _____

Address (optional) _____

Sex _____ Age _____ Last year of schooling completed: _____

Grade school 12345678

High school 1 2 3 4

College 1 2 3 4

Post Grad _____

Number of years as a Keeper _____ Number of Zoos worked in _____

Name of present place of employment _____

Other animal related positions held (include both domestic and exotic related jobs) _____

Types of animals worked with: Herps _____ Birds _____ Land Mammals--Large/Small _____
Marine Mammals _____ Fish _____ Insects _____ Other (please specify) _____

When did you know you wanted to be a Keeper? _____

Why did you become a Keeper? _____

Do you plan to make a career of Zoo work? YES NO

If your future goals are other than a career Keeper, are they animal related? _____

Have you experienced burn-out i.e. frustration with management, animal care, other keepers' attitude toward job, boredom etc.? _____

What, if anything, did you do to cope with it? _____

What is the pay scale at your zoo? _____

What are the opportunities for advancement? _____

What is the ratio of men to women? _____

Who supports your zoo -- State County City Private Zoological Soc.

Other (please specify) _____

What else would you like to know about your fellow Keepers? _____

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

HOOFSTOCK KEEPER...responsible for care and maintenance of African and North American hoofstock. Requires one year's zoo experience. Send resume/references to Hayes Caldwell, Executive Director, Caldwell Zoo, P.O. Box 428, Tyler, TX 75710.

MAMMAL KEEPER...responsible for daily feeding, maintenance, health and behavioral observations of hoofstock. Requires 2 years' experience as mammal keeper. Degree in zoology or related field is desirable. Salary \$11,500-\$12,000 plus benefits. Contact David Anderson, General Curator, Audubon Zoological Garden, P.O. Box 4327, New Orleans, LA 70178 (504) 861-2537.

ANIMAL TECHNICIAN (SENIOR KEEPER)...requires associate degree in life science plus two years' specialized experience in bird husbandry. Prior supervisory experience is desirable. Salary \$1,079-\$1,536 a month plus excellent benefits. Send resume by 1 August to Earl Unell, Chief Examiner, City Hall, Personnel Dept., 414 East 12th Street, Kansas City, MO 64106 EOE.

EXHIBIT CURATOR...requires two years' experience in exhibit design, fabrication, construction and maintenance. Salary \$19,335 - \$25,954. Deadline is 25 July 1983. For more information, contact Mary O'Neill, Personnel Director, Minnesota Zoological Garden, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55121 (612) 432-9010.

TEACHER/NATURALIST...to teach natural science to diverse audiences, coordinate/administer various education programs and design curriculum. Requires BA in natural science or related field and two years' teaching experience. Closing date is 1 August 1983. Send resume to J. Selzer, Academy of Natural Sciences, 19th and the Parkway, Philadelphia, PA 19103.

ASSISTANT CURATOR/EDUCATION...responsibilities include program development and administration, grant proposal and educational material writing. BS in science/environmental education or related field plus three years' experience in teaching or zoo/museum programming required. Strong writing skills and ability to work with people a must. Send resume to Personnel Supervisor, Philadelphia Zoo, 34th St. and Girard Ave., Philadelphia, PA 19104. EOE.

EDUCATION COORDINATOR...responsible for planning and implementation of education and public information programs. Requires BA in zoology, education or related field. Must possess effective writing and speaking abilities; background experience in natural history and teaching preferred. Salary \$12,000 - \$13,000 plus benefits. Submit resume by 25 July 1983 to Paul E. Meyers, Executive Director, Ross Park Zoo, 185 Park Ave., Binghamton, NY 13903.

Keeper's Alert

Keepers hoping to attend the 1983 AAZPA Conference in Vancouver who are finding room rates at the conference hotel to be beyond their means, may obtain a list of alternate hotels by sending a stamped, self-addressed envelope to: Al Johnson c/o Woodland Park Zoo, 5500 Phinney Ave. N., Seattle, WA 98103.

o
p
p
o
r
t
u
n
i
t
y
k
n
o
c
k
s

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST.

Animal Keepers' Forum

Smithsonian Institution Libraries



B. BALL

Dedicated to Professional Animal Care

AUGUST 1983

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Alice Miser
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
Steve Taylor, Louisville Zoo, Louisville, KY 40213
Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Turtle Back Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Gestation Notebook</u>
<u>Bernie Feldman, Topeka Zoo</u>	<u>Mike Coker, Topeka Zoo</u>
<u>Keeper Accomodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, *Director*

Vacancy	ME, VT, NH, MA, RI, CT
Vacancy	NY
Gene Pfeffer	PA, NJ, MD, DE
Angela Keppel	VA, W. VA, D.C.
Randy McGill	MI
Lynne Villers	IN, OH, KT
Larry Sammarco	WI, IL, MO, MN, IA
Vacancy	TN, NC, SC
Alan Sharples	FL, AL, GA
Vacancy	AR, MS, LA
Candy Kroft	TX, NM, CO, OK, KS, NE, SD, ND
Lawrence Gledhill	WA, OR, ID, MT, WY, AK
Joan Stinson	CA, NV, AZ, UT, HI
Vacancy	Canada

This month's cover art is by Brad Ball, a Keeper at Wildlife Safari in Winston, Oregon. Brad's artwork features a Margay. Thank, Brad!

Scoops and Scuttlebutt

RIVERBANKS AAZK CHAPTER DONATES FUNDS FOR CAREER BROCHURE

The AAZK Publications Staff wishes to thank the members of the Riverbanks Zoo AAZK Chapter in Columbia, SC for their recent contribution to the Zoo Keeping As A Career brochure. Riverbanks AAZK Chapter joins other chapters including Puget Sound, Rio Grande, Metro Toronto, South Florida and the Topeka Zoo in helping to underwrite this important AAZK educational project. The four-color brochure may be ordered from Dolly Clark at National Headquarters. The price is \$5.00 per 100 copies plus postage and handling. After placing your order with Dolly, she will bill your Chapter or institution for the proper amount.

EDUCATION COMMITTEE REQUESTS MEMBER INPUT

The Education Committee is trying to come up with some statistics regarding the number of Keepers in North American Zoos. We have a tally on the total number of full-time employees from the AAZPA membership Directory, but would like to know the ratio of Keepers to the total number of employees at Zoos. What is the ratio of Keepers to total employees at your zoo? Please send a postcard to Judie Steenberg, 9550 2nd Avenue N.W., Seattle, WA by 10 September 1983. Thanks.

from the President

Dear Fellow AAZK Members,

Once again the excitement and anticipation of the upcoming national conference is building. The keepers in Philadelphia are busy getting ready for our meetings, sessions, tours and amusement. As usual, the board meetings will be in session all day Sunday, giving you all an opportunity to sit in and give us your thoughts on AAZK business and the projects that the association is and should be pursuing. All projects heads are submitting their annual reports, and most will be in attendance for discussions on the future of their activities.

A schedule listing the order of the reports will be posted on the door of the meeting room so that those of you interested in only a few projects can plan on attending the meetings at those times. All are invited to come in and learn more about the business and administration of your association.

If you have topics for discussion, please submit them to me as far in advance of the conference as you can, so that I can fit them into the agenda and copy written proposals for the rest of the board.

New national officers will be elected during the board meetings from the board members who will be serving the association as of January 1984. Discussions will continue on the proposals to improve or disband the

Regional Coordinator System, and I will appreciate comments from all members on regional activity and better methods of inspiring and coordinating it.

Thank you for all you are doing to make AAZK a responsive professional association.



Sincerely,

Patricia E. Sammarco
President

Zoo Keeper



Letters To The Editor

Dear Editor:

The note in the May issue of Animal Keepers' Forum concerning a "Hot Line" for keepers thinking about leaving the profession seemed more appropriate to the clergy rather than a group trying to promote professionalism in their field. It requires a lot of hard work, education, and talent to be a good animal keeper. If these qualifications are not rewarded with decent pay and respect, then few of us will remain animal keepers for long, either moving up into management or leaving the field entirely. As it becomes more difficult to replace zoo animals from wild populations, the care and breeding of those animals already in captivity becomes more important. A well qualified keeper staff is a very big part of insuring that present captive populations prosper. The only way zoos can insure a supply of experienced, capable, career keepers is to recognize us as professionals and provide the pay and respect we deserve.

The idea that we should stay in the field out of a sense of duty even though compensation may not be adequate only puts off the day that zoo management has to face this problem. In the meantime, we are doing neither the keeper or the animals any good when we talk a reluctant keeper into staying on the job. No one should have to remain in a job that is not completely satisfying and once a person starts having doubts about his career, it is usually only a matter of time before he gets out. By talking a keeper into staying in the field we are probably only delaying the day he finds his way into something more satisfying.

The animals in a zoo have no recourse to their situation. They suffer along with whatever level of care they happen to receive. In light of this, we owe it to them to insure that the care they receive is of the highest level available. A keeper going through doubts concerning his job is almost certainly going to go through low periods when his performance is not what it should be. The animals deserve better. If a keeper wants out, he should get out. Later, if he resolves his doubts and decides that no other job would bring the same satisfaction, he can re-enter the field, but this is a decision he must make on his own and not something we should talk him into doing just because we feel the job is worth the sacrifices.

(Please see p. 255 for reply to this letter from Mary Slaybaugh, co-coordinator of the Keeper Data Survey)

Ted Daehnke, Keeper
Sacramento Zoo
Sacramento, CA

Births & Hatchings

TOLEDO ZOO.....Michelle Grigore

B&H at the Toledo Zoo from April through June 1983 are: Mammals - 2.1 Patas monkey, 0.0.1 California sea lion, 1.0 Blesbok, 1.1 Guanaco, 0.1 Grant's zebra, 0.1 Himalayan tahr; Reptiles - 0.0.5 saw-scaled viper, 0.0.26 Leopard gecko, 0.0.44 Eastern garter snake, 0.0.27 Indian python, 0.0.40 Northern water snake, 0.0.7 Grey rat snake, 0.0.7 Cuban boa, 0.0.3 Tokay gecko, 0.0.1 Chinese water dragon, 0.0.1 Red-footed tortoise, 0.0.1 Elongated tortoise, 0.0.4 Haitian galliwasps; Birds - 0.0.2 Red-billed blue magpie and 0.0.3 Purple-headed glossy starling.

BROOKFIELD ZOO.....John S. Stoddard

Brookfield Zoo reports the following B&H for May and June 1983: Reptiles- 0.0.6 Green crested basilisk, 0.0.8 Australian side-necked turtle, 0.0.19 Poison arrow frog; Birds - 0.0.1 Roul-roul, 0.0.2 Blue-grey tanager, 0.0.2 Flame-faced tanager, 0.0.4 Blue-shouldered robin chat, 0.0.7 Hooded merganser, 0.0.1 Fairy bluebird, 0.0.4 Red and white crane, 0.0.4 Spur-winged plover, 0.0.5 Redhead duck, 0.0.20 Mandarin duck, 0.0.5 Wood duck, 0.0.3 Ruddy duck, 0.0.1 Snowy owl; Mammals - 0.0.5 White-toothed shrew, 0.0.1 Spotted grass mouse, 0.0.6 Spiny mouse, 0.0.2 Mongolian jird, 0.0.4 Degu, 0.0.3 Brown lemming, 1.0 Banteng, 1.1 Wisent, 3.6 Addax, 2.1 Beisa oryx, 4.6 Siberian ibex, 1.0 Okapi, 0.0.1 Capuchin, 0.0.1 Baboon, 1.0 Clydesdale horse, 0.1 Scotch highland cat, and 0.0.1 Yak.

MEMPHIS ZOO.....Robert Evans

The following B&H were recorded at the Memphis Zoo during the month of June: 0.0.7 African fat-tailed gecko, 0.0.1 Seychelle Island gecko, 0.0.14 Reticulated python, 0.0.1 Leopard gecko, 0.0.2 Crimson rosella, 0.0.3 Green-backed heron, 0.0.1 Silver-backed tanager, 0.0.2 Bleeding heart dove, 0.0.9 Ringed teal, 0.0.10 Mandarin, 0.0.1 Rosy-billed pochard, 1.2 Siberian ibex, 0.1 Kirk's dik-dik, 1.0 Lowland gorilla, 2.1 Chinese water-deer, 1.1 Muntjac, 1.0 Grant's gazelle, 0.1 Nilgiri tahr, and 1.0 Sicilian donkey.

LINCOLN PARK ZOO.....Randy McMahon & Susan Moy

The following are the B&H for June 1983 at Lincoln Park: Birds - 0.0.3 American redhead duck, 0.0.1 Buffalo weaver, 0.0.29 Blue winged teal (9 DNS), 0.0.3 Ruddy duck (1 DNS), 0.0.2 Nicobar pigeon (1 DNS), 0.0.31 Wood duck (3 DNS), 0.0.4 American widgeon, 0.0.1 Hooded merganser (DNS), 0.0.2 Golden tanager; Mammals - 0.0.1 California sea lion (DNS), 0.0.3 Agouti, 0.0.1 Owl monkey, 0.0.2 Cotton-top marmoset (1 DNS), 0.0.1 Pygmy marmoset (DNS), 0.0.2 Patagonian cavy, and 1.0 Black leopard.

BLACK HILLS REPTILE GARDENS.....Bill Texel

The Black Hills Reptile Gardens in Rapid City, SD is pleased to announce the following B&H during the first half of 1983: Mammals - 3.2 Pygmy goat, 1.1 Sicilian donkey; Birds - 0.0.12 Zebra finch, 0.0.3 Cordon Bleu finch; Reptiles - 0.0.17 Columbian rainbow boa, 0.0.5 Snapping turtle and 0.0.3 Red rat snake.

BIRTHS AND HATCHINGS, Continued

RIVERBANKS ZOO.....Lex Glover and Tony Vecchio

This is proving to be another exciting year for the Riverbanks Zoo. The first half of this year has seen the following hatchings in the Bird Dept: 4 Bluebills, 8 Red-crested touraco, 1 Black-footed penguin, 1.1 NeNe, 1 Stella's lory, 4 Crimson seedcrackers, 9 Sun conures, 3 Levillant's barbets, 2 Lilac-breasted rollers, 1 Luzon bleeding heart dove, 1 Golden tanager, 1.2 Roul-roul, 1 Black swan, 2.2 Black-necked swan, 10.2 Hooded mergansers, 0.1 Mute swan, 5.3 Red-crested pochard, 8 Ringed teal, 3 Burrowing owl, 1 Cinereous vulture (DNS), 2 Chilean flamingo and 1 Victorian crowned pigeon.

During this same period, the Mammal Dept. has recorded the following births: 1 Ground cuscus, 1 Matschie's tree kangaroo, 2.0 Dama wallaby, 2 Golden lion tamarin, 1.0 White-faced saki, 1.0.1 Black howler monkey, 1 Dusky titi monkey, 0.1 Ringed-tailed lemur (DNS), 1.0 Black and white ruffed lemur, 1.0 Mandrill (DNS), 1.1 Picuost's squirrel (DNS), 1.0.2 Capybara (0.0.2 DNS) and 2.0.1 California sea lion.

LAFAYETTE ZOOLOGICAL PARK.....Denise McKinney

Births and hatchings at the Lafayette Zoological Park from 4-1-83 to 6-24-83 include: 0.0.2 Cacomistles, 0.1 Reeves muntjac, 0.1 California sea lion, 0.0.8 Mandarin duck, 3.0 African pygmy goat, 0.0.1 Wood duck 0.0.11 Rhea (0.0.3 DNS), and 0.0.2 Nutria. Acquisitions during the same time period include: 1.1 Cuban boa, 1.1 Chinese rat snake, 0.0.3 Fire-bellied toad, 2.0 Hermann's tortoise, 1.0 Rock hyrax, 1.0 Two-toed sloth, 0.1 Domestic ferret, 1.1 Lesser galago, 0.2 Barbados sheep and 1.1 Sita-tunga.

MILWAUKEE COUNTY ZOO.....Steven M. Wing

June B&H at Milwaukee in June include: 0.0.17 Canada geese, 0.0.7 Wild turkey, 0.0.2 Barn owl, 0.0.2 Tree shrew (DNS), 1.0.1 Serval (1.0 DNS), 0.0.1 Moose, 1.0 Impala and 3.1 Dall sheep.

BRONX ZOO.....Margaret Price

The Bronx Zoo recorded the following B&H during the month of June 1983: Mammals - 4.0 Snow leopard, 1.3 Formosan sika deer, 0.2 Wisent, 1.0 Pen-tailed bettong, 8.1 Himalayan tahr, 1.0 California sea lion, 1.0 Lesser spear-nosed bat, 1.0 Lesser galago, 1.0 Reeves muntjac, 2.0 Fennec fox, 2.0 African spotted grass mouse, 0.2 Barasingha deer, 3.0 Patagonian cavy, 1.0 Minnie Down's mouse, 0.3 Axis deer, 1.0 Wild cavy and 2.0 Domestic goat; Birds - 3 Bar-headed goose, 5 Crested tinamou, 3 White-quilled black bustard, 9 Mandarin duck, 5 Hooded crane, 3 White-naped crane, 2 Red and white rail, 2 Golden-breasted bunting, 9 Marbled teal, 2 American ruddy duck, 1 Satyr tragopan, 2 Silver gull, 3 American gold-en-eye, 5 Rothchild's mynah, 1 Mauritius pink pigeon and 2 Indian shama thrush.

DALLAS ZOO.....Tami Jones

Births and hatchings at the Dallas Zoo for the month of May 1983 include: Birds - 1 Spotted dove, 2 White-winged dove, 8 Fulvous whistling duck, 1 Jandaya conure, 3 Himilayan Impeyan pheasant, 2 White-cheeked touraco, 1 Oriental turtle dove (DNS), 3 India Blue peafowl; Mammals - 1.2 Emperor tamarin (DNS), 0.1 White-handed gibbon, 1.0 Kirk's dik dik, 1.1 Pygmy goat, 0.1 Hamadryas baboon (DNS), 0.1 Eland; Reptiles - 20 Bismarck ringed python.



Coming Events

ELEPHANT BREEDING SYMPOSIUM

September 16, 1983

Portland, OR

Held at the Washington Park Zoo. For information, contact J. Marks Bieberle, Washington Park Zoo, 4001 SW Canyon Road, Portland, OR 97221, (503) 226-1561.

THE 1983 AAZPA ANNUAL CONFERENCE

September 18-22, 1983

Vancouver, B.C.

The theme for the conference is "Survival in the Eighties". Hosted by the Vancouver Aquarium. For registration and further information, contact Murray A. Newman, PhD., Director, Vancouver Aquarium, P.O. Box 3232, Vancouver, B.C., Canada V6B 3X8.

FOURTH ANNUAL ELEPHANT WORKSHOP

October 14-16, 1983

Kansas City, MO

Hosted by the Kansas City Zoo. To be held at the Sheraton Royal Hotel. For further information, contact Mike Blakely, Curator of Mammals, Kansas City Zoo, Swope Park, Kansas City, MO 64132 or call (816) 333-7406.

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Grand Rapids, MI

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Sacramento, CA

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

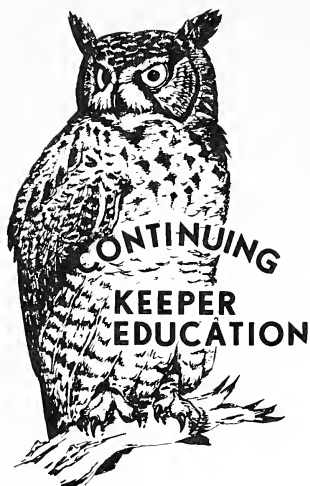
April 15-17, 1984

Omaha, NE

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 29-May 1, 1984

Philadelphia, PA



--- YOUR IMMEDIATE ATTENTION
IS REQUESTED ---

Following are two matters which require your immediate attention. Please respond by September 10th if you:

1. Plan to participate in the CHINA EXCHANGE
2. Want to contribute toward CONTINUING KEEPER EDUCATION.

CHINA EXCHANGE

The response from AAZK Members to the invitation to participate in a working exchange tour with Chinese Zoo Keepers has been very poor. If you are thinking of enrolling, or have questions about this tour, please contact Elandra Aum at the Woodland Park Zoological Gardens, 5500 Phinney Avenue N., Seattle, WA 98103, as soon as possible. YOU DO NOT HAVE TO SUBMIT A DEPOSIT WITH YOUR APPLICATION. The deposit is not due until December 1983, but please let Elandra know of your intention to participate. AAZK members have preference for this tour; non-AAZK people and organizations will be invited to fill in spaces not reserved, See the May issue of AKF (Page 145) for full details.

SECOND REQUEST FOR TRAINING MATERIALS

In January we asked for printed materials being used in Keeper training programs. Several manuals, outlines and information on lecture series have been sent to the Committee. Thank you all who have responded so far. Due to the short period of time left before the Philadelphia Conference, it might not be possible for you to get your materials to us before the Conference. However, your help is being requested in the following ways:

1. Send a postcard, memo or letter briefly describing the Keeper training program at your Zoo, or lack of one, to Judie Steenberg, Woodland Park Zoo. A hand-written letter is fine, just sit down and write it, asap.
2. Give thought to how you and/or your AAZK Chapter might become involved in your Zoo's Keeper Training Program; refer to the June 1983 issue of AKF (Page 173) and the article on Toledo's program.
3. If your Zoo does have printed materials we could review, please ask your Administration for copies. If you or someone from your Zoo is planning to attend the Philadelphia Conference, bring them along. Those not attending can send them to Judie Steenberg.

CONTINUING KEEPER EDUCATION, Continued

Following is a list of the manuals, outlines of lectures, information sheets and/or AKF articles we have received thus far:

AAZPA Animal Husbandry Training Manual; Calgary Zoo's Apprentice Program; Jersey Wildlife Preservation Trust; Santa Fe Community College; Exotic Animal Training & Management-Moorpark; Animal Keeper's Training School, West Germany; Mill Mountain, Roanoke, WV; Auckland, New Zealand; Little Rock Zoo; Metro Toronto Zoo; Topeka Zoological Park; Animal Management Vol I, British correspondence course; Louisville Zoological Gardens; Rio Grande Zoological Park; Baltimore Zoo; London, England; Toledo Zoological Gardens and Crandon Park Zoo.

It has been suggested that Continuing Keeper Education isn't of "general interest" to the Administrator's of our Zoos, and by providing us with your information we will be better able to determine this. Plans are also being made to survey the Directors of AAZPA member Zoos to determine the level of commitment there is toward the subject.

HAVE YOU REGISTERED FOR THE PHILADELPHIA CONFERENCE YET?.....

A complete report from the Education Committee on current projects and plans for 1983-84 will be presented at the Conference.



Information Please

Slides of North American wildlife wanted--I am seeking slides of North American mammals, birds, reptiles & fish for use in educational presentations to schools and adult groups. Please send information on slides available and duplication cost to: Don Rolla, State Director, Elsa Wild Animal Appeal-Illinois, 994 S. Saylor Ave., Elmhurst, IL 60126

On 16 May, 1983, an injured Mississippi kite (*Ictinia mississippiensis*) was turned over to the Audubon Zoo's Wild Bird Rehabilitation Center for treatment. The following morning an egg was found on the bottom of the hospital cage. The egg was artificially incubated by W.B.R.C. Rescue Team members Toby Bradshaw and Tom Courlson, and hatched 17 June 1983. At this time, the chick is doing well. This is the first time such a thing has happened in the history of Audubon Zoo's Rehab program, and is possibly the first hatching in captivity of a Mississippi kite.

Anyone having information on artificial incubation, captive breeding or hand-rearing of this species, please contact Krista Morgan, W.B.R.C. Director, Audubon Zoological Garden, P.O. Box 4327, New Orleans, LA 70178.

Information is requested on the husbandry of aquatic snakes--specifically the Javan Wart Snake or Elephant Trunk Snake (*Acrochordus javanicus*) and the Tentacled Snake (*Erpeton tentaculatum*). We need information on feeding, aquarium water (temperature, pH, etc.) and any other pertinent information available. Please contact Bill Texel, Curator, The Black Hills Reptile Garden, Box 620, Rapid City, SD 57709.

RESEARCH ASSISTANCE NEEDED: Request for mites and ticks from reptiles! Preserve in isopropyl alcohol if 70% ethyl alcohol is not available. Please send ectoparasites to: Sue Barnard, Senior Reptile Keeper, Atlanta Zoological Park, 800 Cherokee Ave., SE, Atlanta, GA 30315.





. . . Feed Bag

(Editor's Note: This month AKF is pleased to present a new column dealing with captive exotic animal nutrition. Entitled "Feed Bag", this column will answer questions concerning nutrition problems and needs of the animals in your care. Dr. Sergio Oyarzun, animal nutritionist at the Metro Toronto Zoo, Toronto, Canada will write the column and Metro Toronto Keeper Neville Pike will be the AAZK coordinator for the column. You are invited to submit your questions for this column to Dr. Oyarzun c/o Metro Toronto Zoo, P.O. Box 280, West Hill, Ontario, Canada M1E 4R5.)

SERGIO OYANZUN, P. Agr., M. Sc.

Sergio was born and raised in Chile, South America. He received a P. Agr. degree from the University of Chile and a M. Sc. (Animal Science) degree from the University of California-Davis.

After graduation, Sergio worked in a variety of capacities at the University of Chile including assistant professor and associate professor in the Department of Animal Science.

Since June 1974 he has been the animal nutritionist at Metro Toronto Zoo where his responsibilities include planning, organizing and implementing the feeding programs for the Zoo's animal collection.

- Q. A pamphlet from the University of Guelph states that too much grain can cause acid indigestion and destroy rumen microbes in ruminants. Please comment further on this: how much would be too much for say an elk or a bison, over what period of time and how would the animal act?

Submitted by Judie Steenberg, Woodland Park Zoo

- A. Ruminants are especially adapted to utilize roughages (high fiber rations) and although they are able to adapt to a mixed diet of roughages and concentrates, they cannot tolerate a diet consisting of 100% grains.

In general, the time required for an animal to adapt when changing from one type of roughage (Timothy hay) to another (Alfalfa hay) would be relatively short (10 days to 2 weeks). However, when increasing the level of concentrates (grains) is the major change, a period of 4-6 weeks or even longer would be required to enable the rumen microorganisms to adjust to a change in food substrate. A sudden change in the diet can be expected to have detrimental effects on the normal rumen microbes and to the animal itself.

The feeding of excessive amounts of readily fermentable carbohydrates (grains) will cause a condition known as "Cereal Poisoning" or "Acute Acid Indigestion". This conditions has also been reported in ruminants feed excessive quantities of apples or potatoes.

FEED BAG, Continued

The excessive intake of grains will induce a selective proliferation of amylolytic (starch-fermenting) microorganisms accompanied by the disappearance of the normal protozoa and cellulolytic (cellulose-digesting) bacteria. As a consequence lactic acid, which is not normally found in significant amounts in the rumen of an animal fed on roughages, will be produced in large quantities and the rumen pH will drop to abnormally low levels (4.5 - 5.0 or even lower) thereby producing acidosis.

The symptoms of "Acute Acid Indigestion" are loss of appetite, loss of rumen motility, lethargy, diarrhea, accelerated respiration rate, craving for roughages, ulceration of the abomasum, necrosis, edema and hemorrhaging of the rumen epithelia. Laminitis is also frequently observed in animals suffering from rumen dysfunction.

The time required to develop clinical symptoms varies depending on the particular circumstances, being as short as a few hours or as long as 2 to 3 days. Some of the animals may die very shortly, while others will suffer from chronic indigestion for a few days to several weeks.

The best way to prevent the development of Acute Indigestion is not to feed grains to any extent or by limiting the amount in the daily ration. How much is too much? Studies with sheep indicate that 800 g of grains per day is the maximum tolerable level. Beyond this level Acute Acid Indigestion will develop in 4 to 5 days. In cattle, 3 to 4 Kg of grains (wheat) have resulted in high level of lactic acid and low rumen pH after 4 to 5 days. Perhaps a very general rule of thumb could be that grains be limited to a daily maximum of 0.5% of the animal's body weight, i.e. a 500 Kg Bison should receive no more than 2.50 Kg of grain. The rest of the daily ration should be made up of roughages.

Based on personal experience, I would not recommend feeding grains to any extent. A proper diet for zoo ruminants could be set by feeding a good quality hay on a free-choice basis together with limited amounts (0.5 - 1.5% of body weight) of a complete balanced pelleted feeding containing high fiber levels (16%). Trace-mineralized or cobalt-iodized salt blocks and a cattle (or sheep) mineral supplement should always be available to the animals.



Keeper's Alert

SPECIAL SESSION ON PROFESSIONAL TRAINING IN ZOOS

Has your zoo been trying to put together a systematic training program for its staff but not been able to because of inadequate time, lack of commitment or non-existent funding? If so, you are not alone -- in an informal survey of fifty zoos, thirty-five indicated they did not have a training program.

A special one-hour session has been set aside at the AAZPA Conference to discuss this problem. (Day: Monday, September 19; Time: 11 a.m.; look on program agenda for place).

If your zoo is interested in organizing a low cost, viable program for professional training of keepers and staff, please send a representative to the meeting. For further information, contact Helen Freeman, Woodland Park Zoological Gardens, 5500 Phinney Avenue N., Seattle, WA 98103 or call (206) 625-4550.





A ZOOLOGICAL GARDEN WITH
NATURE AS ITS DIRECTOR

By
Michael E. Lensch
Assistant Curator
Chehaw Wild Animal Park
Albany, GA

In this day of modern design and new theories, a simple step back to nature with its grace and serenity is a breath of fresh air and a sight to behold.

While visiting our park this feeling of grace and natural beauty is all around you. Being in the southwest section of Georgia, our climate is generally mild with a nice touch of seasonal changes.

How many animal facilities or gardens do you know that have started designing their exhibits towards natural settings or habitats? Well, we've gone a step further--we have done the reverse. We've designed our natural settings into exhibits. Our whole park has about 685 acres with the wildlife section being on the back 150 acres. The general park offers RV and primitive camping, picnicking w/o grills, two playground areas, boating, fishing and water sports which thrive on the adjacent waterways. All these are a few examples of entertainment that our park offers you and your family to enjoy.

Nestled among the pines, we have designed a wildlife park which, in our minds, is second to none. Most of our collection currently is indigenous with some exotics and more coming in the future to balance our theme. A stroll down our dirt or wooden walkways brings you to our viewing areas where bison and elk relax in lush shaded areas. Then to our petting or contact area which brings the animals close enough for your personal touch. Then while walking you come upon our pride and joy--the bobcat suspension bridge, one of the most breath-taking locations in our park. From the bridge the visitor has the opportunity to observe bobcats either eyeball to eyeball in trees 30 to 70 feet above ground, or lounging on the ground. Wandering along the paths you'll see coyotes, red foxes and grey foxes bounding in and around their exhibits.

While you are walking you may or may not notice there is little to no concrete. With all this beauty and raw nature we have our problems--generally revolving around the weather. At times it does enough damage to keep us very active. An example being that anytime you traverse a waterway with a barricade, be it fence or wall, you have the joy of carning or maintaining the area surrounding these man-made dams.

In closing, I would like to relate one of our more comical stories, of which all animal parks have many. We set out with all our expertise, planning and construction (we thought) to design an escapeproof raccoon pen. As we finished the exhibit, we stepped back and just admired the finished product. The time had arrived for releasing the raccoons into their new habitat. Six raccoons were brought over from their holding pen, were set into the new enclosure, were released, and sure enough all six beat us out of the pen. There they were outside watching us leave their so-called escapeproof exhibit.

So like any great idea or plan, improvements and/or modifications are always needed. I wish to thank you all for the opportunity to share with you our facility and also extend to all an open invitation to come and see us.



One call does it all!

NEBRASKA BRAND



Quality Assured Diets
That Have
Constant Formulation
For
Balanced Nutrition
And
Economical Feeding

Frozen Feline Diets
(Horsemeat or Beef)

Frozen Bird of Prey Diets
(Fine or Coarse Grind)

Frozen Canine Diet

Chunk and Chopped Horsemeat,
Hearts, Livers, Rib, Shank and
Knuckle Bones

TOLL FREE

(800)

228-4005

In Nebraska, call collect
(402) 488-6492

Zu/Preem

Feline Canned

Ratite Dry

Primate Canned

Omnivore Dry

Marmoset Canned

Primate Dry

Animal SPECTRUM Inc.
5801 Locust Street

Lincoln, Nebraska 68516



SPECTRUM

Banana Flavored Primate
(15% Protein)

Banana Flavored Primate
Pro-Plus

(25% Protein)

Omnivore Dry

Polar Bear Dry

Canine Dry

Ratite Dry

Hoofstock Supplement
(with Selenium)

ABERRANT NESTING BEHAVIOR

By
Ted Daehnke, Animal Keeper
Sacramento Zoo, Sacramento, CA

We have two male emus at the Sacramento Zoo in a large enclosure with a group of wallaroos. In the spring of 1983, they gave us some unusual problems. Emu pairs share the incubation chores and although our males had not been caged with a female since 1979, one of them began displaying nesting behavior in mid-February. The other male soon joined the first in behavior which included attempting to incubate a plastic owl we use to discourage pigeons, defending the barn in which they were nesting and refusing food. The barn which they were defending is the feeding site and shelter for both the emus and the wallaroos, so another site was provided for the wallaroos.

The emus were provided various objects such as chicken eggs, potatoes, and avocados to incubate in hope that the behavior was temporary. The avocados were used because we felt they would approximate the appearance of an emu egg, but this may not have been important since they were willing to incubate a 15-inch-tall plastic owl. The behavior proved to be less temporary than we had hoped and after nearly two months their droppings seemed to indicate that they were deteriorating and the temporary arrangements for the wallaroos was becoming a burden.

At this point we moved the birds to a holding pen in hope that this would break the cycle. This tactic worked, the birds stopped nesting behavior and resumed feeding within a couple of days of the move. After two weeks in a holding pen, the birds were put back on display and continued normal behavior. The only other problem was that the emus experienced diarrhea once they resumed feeding. This could have resulted from breaking the long fast or from a change in diet. When the emus resumed eating, they showed a preference for the omolene in the wallaroos' feed over their own ratite diet. A fecal examination proved negative for salmonellosis or parasites.

Five weeks after their return to display their diet and feces had returned to normal. Although the birds had been on display for over five years they had shown no nesting behavior in the past. The winter of 1982/1983 was much wetter than usual and we cannot think of any other change which might have triggered this behavior. We would appreciate hearing from others keeping male emus separate from females and from anyone with information which might help avoid these problems in the future. Please send information to Ted Daehnke c/o Sacramento Zoo, 3930 West Land Park Drive, Sacramento, CA 95822.



Don't forget to Vote!!

ELECTION REMINDER

Remember to send in your ballot for National Elections. Return in the pre-address envelope marked "ballot" ONLY. Return to National Headquarters. Ballots must be postmarked no later than 31 August 1983.

SURVEY REQUEST

Mixed-species exhibits have become more prevalent in zoos all over the world. However, the majority of research conducted on inter-taxa interactions has been done in a laboratory-type setting. Due to a lack of communication concerning mixed-species exhibits, much valuable information goes unreported. Therefore, we have initiated a survey of mixed-species exhibits of primates. If anyone has observed mixed-species interactions involving primates and feels they can help, please complete the following questionnaire and mail it to the address below (even if information is incomplete). Any help you can give will be greatly appreciated. Send completed survey to: Kristine Kokkos c/o G. Mitchell, Department of Psychology, University of California, Davis, CA 95616.

PRIMATE MIXED-SPECIES EXHIBIT SURVEY (primate-primate or primate-other taxa)

Your name _____

Primate Species (latin name) _____

Other taxa (latin name) _____

Wild or captive born? _____

Name of captive facility _____

Caging environment (describe size, habitat, etc.) _____

Indoor or Outdoor? _____ Was/is any mixed-species bonding? _____

Was/is there mixed-species grooming (be as specific as possible)? _____

Was/is there apparent hierarchy? _____ (Describe) _____

Were/are there displays of aggression (again be specific, type of behavior, animals and species involved) _____

Describe play behavior observed _____

How and what are the animals fed? _____

Were/are there any problems with the mixed-species exhibit? _____

What was the original purpose of the mixed-species exhibit? _____

Please describe in as much detail as possible the interactions among and between the different species _____

We realize the space allotted here is not enough to fully answer each question but please feel free to attach any additional information to the questionnaire. You and your institution will be fully acknowledged when the results of this survey are published. Thank you.



WHY SAVE BATS?

By

Laurence J. Bayer and Susan M. Barnard
(adapted from Bat Conservation International)
Atlanta Zoological Park, Atlanta, GA

(Editor's note: The following article by Laurence J. Bayer and Susan M. Barnard was submitted to AKF for publication early in 1983. AKF subsequently published a second article from Ecology USA entitled "Bats Remain in Jeopardy..." under the Legislative News column in the June issue. The Bayer/Barnard article should have been published first since it was an original manuscript and not a reprint. We regret any misunderstanding this may have caused.)

Bats have traditionally aroused fear and loathing in humans, who have in turn shrouded them in myth and sought their destruction. As with snakes, people have reacted to bats out of ignorance and superstition; sinister characteristics ascribed to bats have obscured our understanding of their ecological and economic value. A mammal essentially harmless to man is viewed as dangerous and threatening by its human beneficiaries.

With their sophisticated ultrasonic navigation system, bats have mastered the night skies. They are the only major predators of night-flying insects, which they consume in astronomical quantities; a single bat may eat 3,000 insects in one night.

Fruit-eating bats are, like birds, an important factor in the seed-dispersing phase of plant reproduction; many economically important plants depend on bats for pollination. The shelves of our grocery stores contain many products from bat-adapted plants, including peaches, bananas, avocados, almonds, cashews, cloves and dates.

Bats also have contributed to medical and scientific research. Their sonar-like ultrasonic guidance and detection system has inspired research into the development of navigational aids for the blind. Their high resistance to disease makes bats valuable in immunological research.

In Third World countries like Africa and Asia, bats are an important source of human food and their guano is a readily available source of fertilizer, low in cost and rich in plant nutrients.

Bats the world over are threatened with extinction. Their highly specialized mode of living and feeding, their unusually low reproductive rate (only one offspring per year), and their vulnerability to environmental changes would make their survival in the modern age uncertain even if humans were indifferent to bats.

Pesticide poisoning has drastically reduced the population of Free-tailed bats in the southwestern United States. Many thousands of bats fall victim to cave explorers who unwittingly or intentionally disrupt the bats' hibernation in winter; the bats' stored fat reserves are more rapidly depleted, and the bats starve before spring.

The greatest threat to bat survival, however, comes from relentless hos-



Barnard and bat see eye to eye. Egore, the only survivor of seven Big Brown bats sprayed with pesticide, was reared from infancy by reptile keeper, Sue Barnard at the Atlanta Zoo. (Photo by Manny V. Rubio)

tility and unjustifiable persecution by humans. Sensationalized news stories of bats spreading rabies and other infectious diseases to man and livestock have formed extermination campaigns in the name of public health. There is no evidence that bats are any more dangerous to human health than are birds and domestic pets; nor are bats aggressive and prone to attack without provocation as is often claimed.

Nevertheless, thousands of bat colonies are wiped out each year worldwide, their roosting places poisoned, demolished with explosives or sealed up. Medieval superstitions about bats have been reinforced by misinformed scientific rationalizations, and

the resulting misconceptions are contributing to the rapid disappearance of a unique and remarkable animal.

Bat Conservation International was founded to meet the urgent and increasing need for funding of conservation efforts. Its purpose is to prevent extinction of bat species, to insure survival of viable bat populations, and to inform the public on the value of bats.

HELP SAVE BATS!! Write to Bat Conservation International for your membership, c/o Milwaukee Public Museum, Milwaukee, WI 53233.



Mourning the Death of a Hand-Raised

By
Anne E. Wiggins, Mammal Keeper
Jacksonville Zoo, Jacksonville, FL

You cry a little
and you wonder
Was it really worth it?
All the hours
All the caring, loving, worrying
All the hopes

You smile a little,
at the memories
The first time he took
the bottle on his own
Without your help
And you knew then, he
was growing up

You think a little,
every hour of the day
Of his special noises
Of his response to yours,
and only your voice
And you wonder, why him?

It hurts alot, and you
swear you'll never do it again
But only you know
if you really will
You visit his old pen
and you cry a little

Reptile Amphibian potpourri

THE CARE AND REPRODUCTION OF THE GIANT DAY GECKO (*Phelsuma madagascariensis*) AT THE SANTA FE COMMUNITY COLLEGE TEACHING ZOO

By
Brenda Brochstein, Graduate
Santa Fe Community College Teaching Zoo
Gainesville, FL

A breeding program for the Giant day gecko (*Phelsuma madagascariensis*) was established in April of 1980 at the Santa Fe Community College Teaching Zoo with the acquisition of 1.2 adults as part of the collection. As of April, 1982, these adults have produced 22 eggs. Six of these were successfully hatched and are being raised at the Teaching Zoo. This species of day gecko is from the island of Madagascar, and is listed on Appendix II of the CITES (Commission on International Trade of Endangered Species) Treaty. This paper will attempt to review all data collected to date at the Teaching Zoo. It is hoped that this information will add to the information currently available to those wishing to breed this endangered species.

Housing

The breeding unit and exhibit for the adults is a fiberglass enclosure 133cm x 89cm x 99cm. The top is covered by a screen of .64cm hardware cloth and porch screen netting. The front is plate glass with an east exposure thus allowing sunlight to enter. The substrate used is pea gravel with live plants and branches. A piece of bamboo is placed in the display towards the rear near the door and is leaning against the wall. The opening is on top of the tube approximately 58cm above the gravel substrate. The cavity is approximately 10cm deep and is filled to 1.3cm from the top with vermiculite. This piece of bamboo has been provided at all times for the females to use when depositing their eggs.

Holding enclosures for the young and occasionally the adults, include glass gallon jars with a piece of bamboo placed vertically, and ten-gallon aquaria, also provided with vertical bamboo and branches. Lighting for the breeding unit is provided through both sunlight and General Electric fluorescent lights suspended above the unit. A General Electric Mercury Vapor Sun Lamp is provided for young animals and adults in holding cages in addition to the fluorescent lighting. At first young were placed under the sunlamp for short periods of 15-30 minutes. The ultraviolet light is important for calcium deposition and vitamin D₃, especially in young animals (Antonio, pers. comm.) Eventually the animals were left under the lamp approximately eight hours a day. The average ambient temperatures in the reptile house ranged from 20°C - 22°C with 15°C as the lowest recorded temperature and 33°C as the highest recorded temperature. Relative humidity was not determined, but as humidity is important for proper shedding (Antonio, pers. comm.), the enclosures are misted daily. Drinking water is provided by using a five-gallon bucket/drip system in the exhibit thus supplying the Phelsuma with a constant supply of fresh water.

Nutrition

Diet has changed slightly over the years. The original diet was as follows:

CARE AND REPRODUCTION OF THE GIANT DAY GECKO, Continued

Adults - 128g strained fruit baby food with 1 tsp. Ca/P and 2 squirts linatone mixed well (Monday, Friday). 20 live crickets on Wednesday.

Hatchlings - 2:1 ratio of strained fruit baby food to Ca/P every day. 2 pinhead crickets dusted with Ca/P powder every day.

At first there was a problem as to how much calcium phosphorus (Ca/P) to add to the baby food. Too much Ca/P would make the baby food mixture too granular, and too little Ca/P would result in calcium deficiency problems. One of the early hatchlings died at age 20 days probably due to both U.V. light, calcium and vitamin D₃ deficiency.

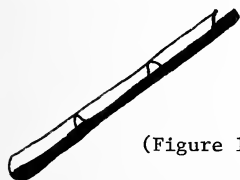
The modified diet which is in current use is as follows:

Adults - 64g strained fruit baby food with $\frac{1}{2}$ tsp. Ca/P mixed well (Monday, Friday). Live adult crickets - ad lib.

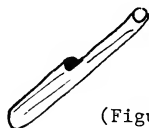
Hatchlings - 2:1 ratio strained fruit baby food to Ca/P powder - ad lib. (Wednesday, Friday) Live pinhead crickets - ad lib.

Linatone (vitamin supplement) was put in the original diet to add vitamin D₃ and allow for proper calcium deposition until the U.V. light regime was started.

Adults are fed in either shallow dishes, or pieces of bamboo with ledges on which to place the baby food mixture (Figure 1a). Originally, the mixture was put on plastic tubes with silicon ridges. This was very difficult to clean due to the crevices made by the silicon. This method was discontinued in favor of the bamboo after the silicon ridged separated after cleaning. Hatchlings are also fed on pieces of bamboo (Figure 1b).



(Figure 1a).



(Figure 1b).

With the addition of the calcium phosphorus powder (as well as the U.V. light), calcium deficiency problems have been reduced, and there are no apparent problems with egg shell formation, proper shedding, or firmness of skeleton.

Reproduction

Eggs were deposited between December 1980 and July 1981. Table I lists the dates of deposition, numbers of eggs laid and hatched, and incubation periods. A clutch was usually deposited in a bamboo tube provided in the exhibit. On several occasions, females have been seen to carry their eggs between their back feet. One female remained with half her body inside the bamboo tube for three hours, after which a single egg was found. Eggs are removed from the bamboo tube by using a curved fork. The eggs were then placed in a plastic shoe box lined with 1 inch moist vermiculite. It is placed on a shelf in the reptile house with a high-low

CARE AND REPRODUCTION OF THE GIANT DAY GECKO, Continued

thermometer placed on the box to monitor the temperatures. The shoe box was misted if there was no condensation seen. The eggs were spherical, white and in some cases, were adhered together. Only four out of 13 clutches consisted of single eggs. Seventy-two percent of the clutches consisting of two eggs were fertile. Table II lists the number of eggs deposited per clutch and fertility. Fertility was determined by the method of candeling, in which the egg is held up to a small area of light.

The Teaching Zoo used a flashlight in a dark room. If the egg is pinkish in color, it is considered fertile. Hatching success was 42% (9 out of 22 eggs). Incubation periods varied between 63 and 79 days.

TABLE I -- Incubation period, hatching numbers, and numbers of eggs laid by Phelsuma madagascariensis at Santa Fe Teaching Zoo, Florida.

<u>Date laid</u>	<u># of eggs</u>	<u>#Hatched</u>	<u>Incubation period (days)</u>
13 Dec. 80	2	2	72 days: 79 days
1 Jan. 81	2	1	75 days
23 Mar. 81	1	1	72 days
26 Apr. 81	1	1	70 days
18 Jun. 81	2	2	63 days: 66 days
12 Jul. 81	2	1	71 days

TABLE II -- Clutch identification, fertility, and number of eggs per clutch of Phelsuma madagascariensis at Santa Fe Teaching Zoo, Florida.

<u>Clutch I.D.</u>	<u># of Eggs laid per clutch</u>	<u>Fertility</u>
A	2	Both infertile
B	2	Both fertile
C	2	Both fertile
D	2	Both infertile
E	1	Fertile
F	1	Fertile
G	1	Fertile
H,I	2, total	H fertile; I infertile
J,K	2, total	Both fertile
L,M	2, total	Both fertile
N,O	2, total	N fertile; O infertile
P	1	Fertile
Q,R	2, total	Both fertile

CARE AND REPRODUCTION OF THE GIANT DAY GECKO, *Continued*

Temperature and Incubation Periods

Temperature within the reptile house was monitored daily over a eight-month period using a high/low thermometer. During this eight-month period, 15 eggs were laid and five were successfully hatched. The temperature data collected during the incubation period for these five eggs was averaged. Table III lists the dates of incubation along with the minimum and maximum temperatures for this period of time.

TABLE III -- Incubation dates, average minimum temperatures, and maximum temperatures for *Phelsuma madagascariensis*.

Egg	Dates of incubation	Average min. temperature °C	Average max. temperature °C
B	12/13/80-2/23/81	22.79°	28.64°
B	12/13/80-3/2/81	22.93°	28.19°
C	1/1/81-3/6/81	22.46°	29.14°
F	3/23/81-6/13/81	22.95°	28.70°
G	4/26/81-7/5/81	21.93°	28.04°

The average minimum temperature of the five eggs was plotted against incubation periods with this data indicating that the higher the minimum temperature, the longer the incubation period (Figure A). The average maximum temperature of the five eggs were also plotted against incubation periods (Figure B). This data indicates that these maximum temperatures apparently had no relationship to the length of incubation. Finally, the difference between the average minimum and maximum temperature for each egg was plotted against the incubation period (Figure C). This data reveals that as the difference between temperatures (ΔT°) increases, the length of incubation decreases. This could indicate that temperature fluctuations may play an important role in the length of incubation for this species.

Behavior

Data on courtship, copulation, and other special behaviors of this group is very limited for the time period involved. Acts observed among the three adults included circumduction, head bobbing, and wriggling of the tail in a lure fashion. These acts could be interpreted as territorial, aggressive and/or courtship displays (Demeter, 1976). The two females have established a definite dominance hierarchy. The dominant female (417-02) has attacked the subdominant female (417-01) on several occasions, inflicting damage in the form of superficially torn skin. The wounds occurred on the cheek and side of the subdominant female.

The skin of this species of day gecko is very delicate and is easily torn (Vosjoli, 1978, Rundquist, 1979). Dr. Elliot Jacobson of the University of Florida Veterinary College attempted to restrain a female in his possession, and the skin became torn during the handling. He attempted to suture the wound with ophthalmic sutures, but was unsuccessful (Ellis, per. comm.).

Hatchlings are usually housed individually as they generally hatch out one at a time. Additionally, size variation due to growth rate based on hatching data (Bodsky, 1966, Demeter, 1975) make it preferable to have each animal separately housed. The National Zoological Park separates their young to prevent competition and aggression between neonates (Demeter, per. comm.).

FIGURE A -- Minimum Temperatures

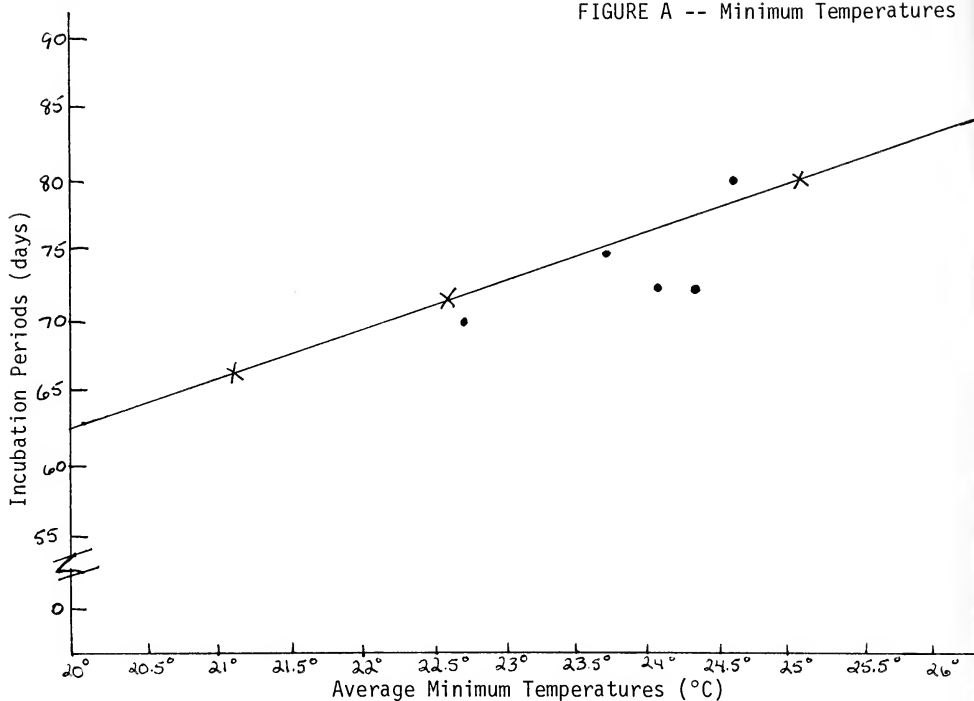


FIGURE B -- Maximum Temperatures

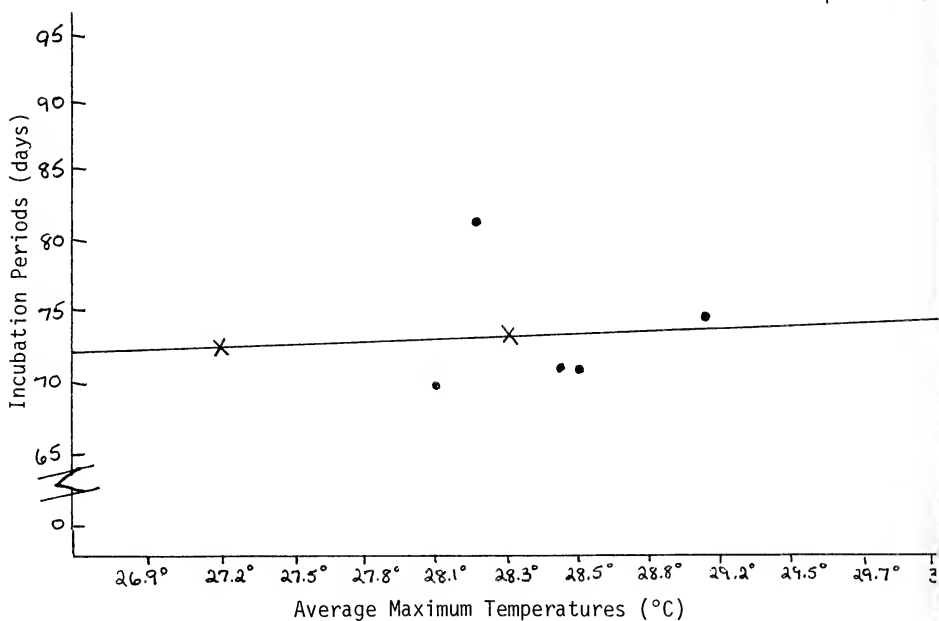
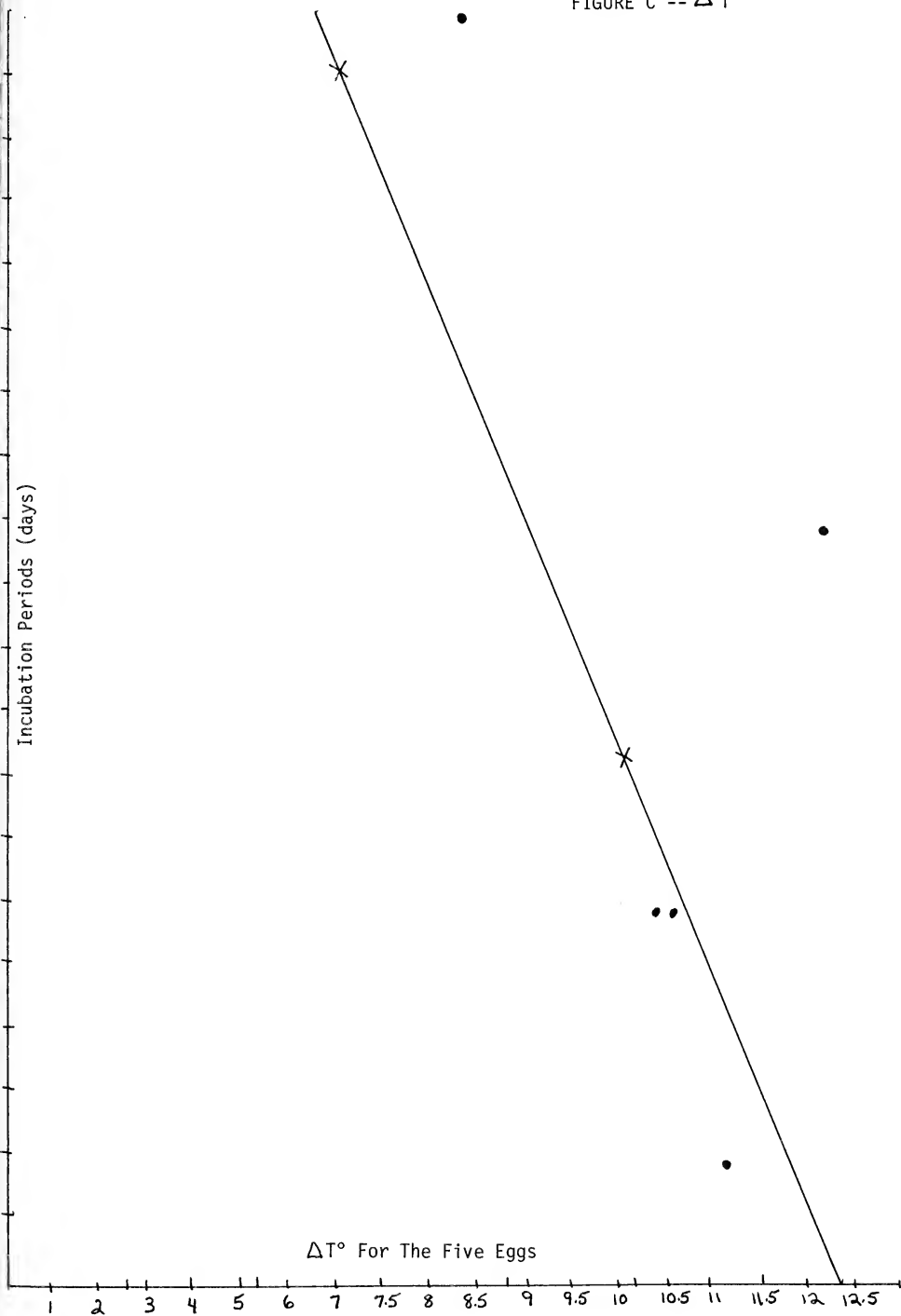


FIGURE C -- ΔT°



CARE AND REPRODUCTION OF GIANT DAY GECKO, Continued

Discussion

The diet offered Phelsuma in this study appears to be much more simplified than those offered at other facilities. The National Zoological Park provided multivitamin supplements, egg yolk, pieces of fruit, as well as calcium carbonate (Demeter, 1975. Demeter, per. comm.) The Steinhart Aquarium fed their Phelsuma fruit baby food, and apparently no calcium or vitamins. Although the eggs were "calcareous", young lizards died two weeks after hatching, or were dead inside the egg (Switak, 1965). Phelsuma at the Gloucester Point Zoological Trust are fed insects, pink mice, calcium, multivitamins, and crushed fruit. The multivitamin is mixed in water and is misted on specimens to prevent scurvy and rickets (Brown, 1977). The Teaching Zoo has had no apparent problems with calcium deficiencies, or with vitamin deficiencies since the implementation of U.V. light and calcium phosphorus added to the diet.

Incubation periods at the Teaching Zoo varied from 63-79 days as compared to the National Zoological Park of 44-66 days (Demeter, 1975), 60-139 days at the Gloucester Point Zoological Trust (Brown, 1977). The wide range of incubation periods suggests that perhaps temperature, humidity or husbandry may influence incubation periods, but this requires further study.

Temperature fluctuations may have played an important role in this study in the length of incubation. It should be noted that the sample size was small, so results are difficult to interpret. There are several periods when no data was collected. Temperatures were obtained only once a day and at variable times, and the thermometer used gave no indication as to when the minimum or maximum temperature was attained, or for how long the temperature was sustained. It is recommended that in the future, data should be collected using more refined techniques and equipment as it is evident that more detailed and accurate information is necessary in order to better analyze the husbandry requirements for Phelsuma. The use of an instrument which provides a continuous temperature reading throughout a 24-hour/7-day period is recommended. Additionally, the following data should be collected and analyzed: egg weights; time of egg deposition; humidity measurements; food analysis; identification of which female lays which eggs; and age of female vs. fertility.

It is hoped that the information provided here will help to further the knowledge of captive husbandry of the Giant day gecko (Phelsuma madagascariensis).

References

- Antonio, Frederick. (1982): Personal communication.
- Brodsky, O. (1969): Breeding of the great house gecko Gekko gekko at Prague Zoo. Int. Zoo Yb. 9:37-39.
- Brown, J. (1977): Tips on the captive reproduction of Phelsuma madagascariensis. Animal Keepers' Forum. 4(12): 155-157.
- Demeter, B.J. (1976): Observations on the care, breeding and behavior of the giant day gecko Phelsuma madagascariensis at the National Zoological Park, Washington. Int. Zoo Yb. 16:130-133.
- Demeter, B.J. and Dale Marcellini (1981): Courtship and Aggressive Behavior of the Streak Lizard (Gonatodes vittatus) in Captivity. Herpetologica. 37:250-255.

CARE AND REPRODUCTION OF THE GIANT DAY GECKO, Continued

Demeter, B.J. (1982): Personal communication.

Ellis, James (1982): Personal communication.

Grimpe, Rusty (1982): Koch's Day Geckos at the Tulsa Zoo. Tulsa A.A.Z.K. Newsletter. Issue No. 4:6-8.

Rundquist, Eric (1979): Reproduction and captive maintenance of Kock's Day Gecko (Phelsuma madagascariensis kochi). 3rd Annual Reptile Symposium on Captive Propagation and Husbandry, 80-84.

Switak, K.H. (1966): Notes on the nutrition and care of the Madagascar day gecko (Phelsuma madagascariensis), at Steinhart Aquarium. Int. Zoo Yb. 6:107.

de Vosjoli, Philippe (1978): Notes on the captive care and maintenance of day Geckoes. National Association for Sound Wildlife Programs. Vol. 2 #1, 67-69.

*I gratefully acknowledge the assistance of Richard Rosen, Fred Antonio, and Jim Ellis, without whose help this paper would not have been written. Special thanks to the students of Santa Fe Community College Teaching Zoo, especially my graduating class.



LETTER TO THE EDITOR, continued

Dear Mr. Daehnke,

I think you have misunderstood the purpose of the "Hot Line". Our intention is not to talk someone who would rather be doing something else into staying in the zoo profession. But, there are many of us who love what we are doing and, while nothing else would fulfill us as much, we nonetheless suffer from frustration because of lack of recognition as professionals, lack of input, etc. The "Hot Line" is an attempt to give serious keepers the opportunity to vent their frustration so that they can maintain the highest level of care possible. Since the expense of the call is the responsibility of the caller, it is my opinion that only those who seriously want to stay in the profession will avail themselves of the "Hot Line". To allow these serious, dedicated keepers to quit is not to our mutual benefit. In the first place, re-entering the profession in many zoos is difficult at best. Further, many of the problems you indicated can only be solved by serious-minded professionals working at solutions from the inside. Once a person leaves, his voice is silenced as he is labeled a disgruntled quitter. It is to be hoped that keepers who attain managerial positions will remember their keeper days and continue to work for improvement for all. But again, rather obviously, a keeper who quits can hardly expect to attain a managerial position.

While our profession has many frustrations, it is important to remember that every other job in the world has the same frustrations and if holding out a helping hand to a fellow keeper, or anyone else, is clerical then perhaps it's time more of us became clerical.

Mary Margaret Slaybaugh, Keeper
San Antonio Zoo
San Antonio, TX



THE STRUGGLE FOR SURVIVAL

CAPTIVE BREEDING MAY BE LAST HOPE FOR MANATEES

Manatees are in danger of extinction unless their only enemies--human beings--become their active partners. In Florida, annual mortality among "sea cows" now greatly overwhelms their reproductive ability to replace their losses, state biologists have reported. Last year at least 123 manatees died there but only 60-80 were born to the population of about 1,000 animals, the only survivors in North America. Some experts believe breeding the manatees in captive colonies may be the animal's only hope of survival.

At the Miami Seaquarium manatees are reproducing in captivity, but even there, breeding efforts are hampered by the meager knowledge of the habits, biology and chemistry of a mammal that has inhabited the earth for at least 50 million years. Recent studies have called into question many of the "facts" long believed about the manatee. For example, it is now known that the females are not ready to breed until the age of seven or eight (twice as old as previously thought) and that the gestation period is closer to two years than 13 months as stated in the literature. Calves nurse for at least a year and sometimes two, so it takes about four or five years for an animal to have a second calf.

University of Florida biologist Paul T. Cardeilhac hopes eventually to use artificial insemination with manatees to help prevent inbreeding of captive populations and to reduce the number of males needed in captivity (manatees mate for life, so currently a male is needed for each breeding female). Reproductive success in the captive colonies studied has followed an improvement in the animals' diet, which once consisted almost entirely of iceberg lettuce. Even on lettuce, the cost of feeding two manatees is about \$1,700 a month. Captive animals are now given a variety of vegetation as well as vitamin and mineral supplements.

The manatees' closest living relative is the elephant. Its dental structure and sexual behavior closely resemble that of the elephant, but in place of legs the manatee has flippers in front and a fluke in the rear. Manatees can live for long periods in fresh or salt water.

There are now only four species of manatees left: the Amazonian manatee, West African manatee, the dugong, and the West Indian manatee. Florida's West Indian manatee is being destroyed primarily by the propellers of power boats, the lines and traps of fishermen, malicious attacks by people and perhaps even the herbicides used to clear Florida waterways of the aquatic weeds that are the manatees' primary food. Still, Cardeilhac thinks that people and manatees can co-exist if more people become aware of the manatees' fragility and respect their turf. Keeping power boats out of areas where manatees congregate in winter and equipping boats with propeller guards could greatly reduce manatee deaths, Cardeilhac noted.

---Ecology USA, June 1983

Legislative News

Compiled by Kevin Conway
Legislative Coordinator

ENDANGERED AND THREATENED SPECIES LISTING AND RECOVERY PRIORITY

On 19 April, the Fish & Wildlife Service (FWS) published its draft guidelines for recovery priorities of endangered and threatened species under the Endangered Species Act. The FWS believes it is necessary to establish priorities for listing, delisting and recovery actions to make the best use of limited resources. There are three categories of priorities: listing or reclassification from threatened to endangered; delisting or reclassification from endangered to threatened and recovery plans.

The criteria used for listings, delistings and reclassification priorities include: degree and immediacy of threat, distinctiveness denoted by assignment of species to a monotype genus, distinctive or isolated gene pools, management burden, likelihood of removing greatest impact of human activities and interest expressed by the public to reclassify the species (in the form of a petition to FWS).

The criteria used for the development of a recovery plan include: degree of threat, recovery potential, taxonomic status and degrees of conflict of species with development.

---K. Vehrs in AAZPA Newsletter
June 1983

BACKGROUND ON LISTING AND RECOVERY PRIORITY GUIDELINES

In 1979, a report to Congress by the General Accounting Office (GAO) recommended that the USFWS officially adopt a listing priority system based primarily on consideration of degree of threat faced by the species. Later, in 1979 Amendments to the Endangered Species Act required that guidelines be established and published in the *Federal Register*. Guidelines were adopted by the Service in 1980, but were not published in the *Federal Register*. This system was subsequently revised in 1981 so that priority for listing would be assigned within a given category of degree of threat so as to generally favor vertebrate animals ("Higher life forms").

The 1982 Amendments to the ESA retained the requirement that the guidelines be published. The 1982 amendments, however, necessitate the revision of the present system, since they specifically prohibit adoption of any system that would give consideration to whether species were "Higher life forms." The April 9, 1983, proposal is intended to satisfy the requirements of the 1982 legislation.

Although the Service strongly encouraged the development of recovery plans, the preparation of recovery plans was elective until passage of the 1978 Amendments to the ESA. This legislation required the development of a recovery plan for every listed species, unless such a plan would not promote the conservation of the species.

During fiscal year 1977, the Service developed a draft recovery priority system to be used as a guide for recovery planning and resource allocation. The 1979 GAO report recommended that this draft system be approved and implemented, and this system was adopted by the Service in 1980. It was subsequently revised to give priority to "high life forms" as in the 1981 listing priority system. The recovery priority system now proposed deletes this preference for "high life forms" and adds a new criteria on conflict, required by the 1982 amendments.

LEGISLATIVE NEWS, *Continued*

Listing Guidelines

Three criteria are used in the proposed guidelines to establish 12 priority categories for species to be listed or reclassified from Threatened to Endangered as follows:

Priorities for Listing or Reclassification From Threatened to Endangered

THREAT			
Degree	Immediacy	Taxonomy	Priority
High.....	Imminent.....	Monotypic	
		genus.....	1
		Species.....	2
		Subspecies.....	3
	Potential.....	Monotypic	
		genus.....	4
		Species.....	5
Low to Moderate.....	Imminent.....	Monotypic	
		genus.....	7
		Species.....	8
		Subspecies.....	9
	Potential.....	Monotypic	
		genus.....	10
		Species.....	11
		Subspecies.....	12

The first proposed criteria is the degree of threat. Species facing the greatest threats to their continued existence would receive highest listing priority. The second criteria, immediacy of threat, is intended to assure that species facing actual, identifiable threats be given priority over those having only potential threats. The third criteria is intended to assign resources on a priority basis to those species representing highly distinctive or isolated gene pools, as reflected by the taxonomic level at which they are recognized. (The more isolated or distinctive the gene pool, the greater contribution its conservation is likely to make to the maintenance of ecosystem diversity.)

In accordance with Section 4(c)(2) of the ESA, the Service currently reviews listed species every 5 years to identify any that might qualify for removal or reclassification. The proposed guidelines would employ two criteria to establish six priority categories for deleting or reclassifying species from Endangered to Threatened when evidence is available to warrant such actions.

Priorities for Delisting and Reclassification From Endangered to Threatened

Management Impact	Petition Status	Priority
High.....	Petitioned action.....	1
	Unpetitioned action.....	2
Moderate.....	Petitioned action.....	3
	Unpetitioned action.....	4
Low.....	Petitioned action.....	5
	Unpetitioned action.....	6

LEGISLATIVE NEWS, *Continued*

Priority considerations would concern whether or not protection under the ESA is any longer necessary and whether the listing causes an unwarranted management burden or unnecessarily restricts human activities. (Inaccurate listing could divert resources from more appropriate activities.) Secondly, the system takes into account whether or not the Service has been petitioned to remove the species from the list or reclassify it. This consideration is also intended to give highest priority to species whose delisting is likely to remove the greatest impacts on known activities inasmuch as such species would also be likely to be subjects of petitions. The decision regarding whether a species will be retained on the lists or in the Endangered category, however, must be based on the considerations contained in Section 4(a)(1) of the ESA and 50 CFR 424.11.

Recovery guidelines

The proposed recovery guidelines use four criteria to establish 18 priority categories as follows:

Recovery Priority

Degree of Threat	Recovery potential	Taxonomy	Priority	Conflict
High.....	High	Monotypic genus.....	1	1C
	.....	.....	.....	1
	High.....	Species.....	2	2C
	.....	.....	.....	2
	High.....	Subspecies.....	3	3C
	.....	.....	.....	3
	Low.....	Monotypic genus.....	4.....	4C
	.....	.....	.....	4
	Low.....	Species.....	5.....	5C
	.....	.....	.....	5
	Low.....	Subspecies.....	6.....	6C
	.....	.....	.....	6
Moderate...	High.....	Monotypic genus.....	7.....	7C
	.....	.....	.....	7
	High.....	Species.....	8.....	8C
	.....	.....	.....	8
	High.....	Subspecies.....	9.....	9C
	.....	.....	.....	9
	Low.....	Monotypic genus.....	10.....	10C
	.....	.....	.....	10
	Low.....	Species.....	11.....	11C
	.....	.....	.....	11
	Low.....	Subspecies.....	12.....	12C
	.....	.....	.....	12
Low...	High.....	Monotypic genus.....	13.....	13C
	.....	.....	.....	13
	High.....	Species.....	14.....	14C
	.....	.....	.....	14
	High.....	Subspecies.....	15.....	15C
	.....	.....	.....	15
	Low.....	Monotypic genus.....	16.....	16C
	.....	.....	.....	16
	Low.....	Species.....	17.....	17C
	.....	.....	.....	17
	Low.....	Subspecies.....	18.....	18C
	.....	.....	.....	18

LEGISLATIVE NEWS, Continued

The first proposed criteria is the degree of threat. Thus the species with the highest degree of threat have the highest priority for preparation and implementation of a recovery program. The second criteria concerns the degree of recovery potential; those species with high recovery possibilities within each "degree of threat" category would be given high recovery priority. The third criteria is intended to devote resources on a priority basis to those species representing highly distinctive or isolated gene pools; taxa that are most genetically distinct would receive priority within any given category of threat. As with the third criteria, the fourth is directly responsive to the requirements of the 1982 amendments of the ESA. The fourth criteria assign priority to recovery planning depending upon whether or not the species is in conflict with construction or other development projects or other forms of economic activity. Any listed species or subspecies, lacking a recovery plan, and identified as being or having a reasonable potential for being in conflict with construction or a development project, would qualify for the conflict column of the recovery priority matrix.

The Service recognizes that it is necessary to assign priorities to listing, delisting and recovery actions in order to make the most appropriate use of limited resources. Since the proposed priority systems are based on factors that are subjective to some degree, they must be viewed as guides and should not be looked upon as inflexible frameworks for determining resource allocations.

---Endangered Species Technical Bulletin
Vol. VII, No. 5

DEPARTMENT OF TRADE PROPOSED

On 3 May, Secretary of Commerce Malcolm Baldrige announced the Reagan Administration's plans for a new Department of Trade. It will encompass much of the old functions of the present Department of Commerce. There is, however, much uncertainty about the future of the National Oceanic and Atmospheric Administration (NOAA). The National Marine Fisheries Service, which is responsible for marine fisheries and most marine mammals, is part of NOAA.

The following possibilities are being discussed for NOAA's future: become an agency in the Departments of Interior, Agriculture, Transportation or Trade; become a separate agency (like the Environmental Protection Agency or the National Aeronautics and Space Administration); the parts pertaining to the ocean be joined with the Coast Guard and Marine Administration to become an oceans agency; or be completely dismantled with parts going to various departments. Any of the proposed changes will require congressional action. The Administration will probably outline its plans for NOAA in the near future.

---K. Vehrs in AAZPA Newsletter
June 1983



Conference..... 83

IMPORTANT NOTES

-Please remember: if you want a specific roommate to share a double room with be sure to put that person's FULL NAME on the hotel reservation form. Please see July's AKF page 227 for more details.
-Day rates and registration forms for daily events can be found in the July AKF page 227.
-Don't forget your animal-related item for the auction.
-PLEASE register as early as possible...Thanks.
-Information on discounted air fare rates through AIRCORP can be found on pages 228-229 of the July AKF. See page 262 of this issue for cities from which AIRCORP can book your reservations.

TENTATIVE SCHEDULE FOR THE 1983 CONFERENCE

Sunday, October 2nd

Board Meetings
Registration
Icebreaker--held in
"Smart Alex" at the
Holiday Inn

Monday, October 3rd

General Session
Free Evening
Hospitality Room

Tuesday, October 4th

Day at the Philly Zoo
Volleyball Game
Picnic Lunch
Dinner in the Rare
Mammal House
Hospitality Room

Wednesday, October 5th

General Session
Afternoon at Brandywine
Zoo with dinner provided
Hospitality Room

Thursday, October 6th

General Session
Banquet and Auction **

**Reservations for the banquet must be in by September 29, 1983--NO EXCEPTIONS.



SAVE ON AIR COSTS



Lower than Excursion or Super-Saver fares!

As the official convention travel coordinator, **Aircorp** has established special convention airfares, on regularly-scheduled airlines, which are *lower than supersaver and lower than group rates.*

These airfares are not available to the general public and will be offered only to those participants booking reservations through Aircorp.

Call the airlines, call your Travel Agent,

then call **Aircorp**!

800-526-0110 and in N.J. Call 201-488-9330!

Discounted air service to the AAZK 1983 Philadelphia Conference is available from the following cities:

Albuquerque
Amarillo
Atlanta
Austin
Baltimore
Baton Rouge
Beaumont
Billings
Boston
Brownsville
Burbank
Casper

Cincinnati
Colorado Springs
Corpus Christi
Dallas
Denver
Detroit
El Paso
Grand Junction
Grand Rapids
Green Bay
Houston
Kalamazoo-
Battle Creek
Kansas City

McAllen
Memphis
Midland-Odessa
Milwaukee
Minneapolis-
St Paul
Nashville
Ontario, CA
Phoenix
Portland
Rapid City
Reno
Salt Lake City
San Antonio

San Diego
San Francisco
San Jose
Seattle-Tacoma
Shreveport
Lafayette
Laredo
Lansing
Las Vegas
Los Angeles
Lubbock
Tucson
Washington, D.C.

1983 AAZK NATIONAL CONFERENCE REGISTRATION FORM

Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

CONFERENCE REGISTRATION

NAME: _____ AAZK MEMBERSHIP STATUS & FEE:
ADDRESS: _____ Member or Spouse.....\$50.00
CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00
ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
(After 15 August, 1983)
PHONE NUMBER: () _____
ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____

AREA OF INTEREST _____

WILL YOU BE SUBMITTING A PAPER? YES NO
(\$15.00 will be refunded from registration fee upon acceptance of paper)

NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____

VEGETARIAN? YES NO. If YES, Special Instructions _____

One-Day Rates for individual conference events are available. Contact Gene Pfeffer for details.

TRANSPORTATION _____ (car, plane, etc.)

PLEASE MAKE THIS CHECK PAYABLE TO: "PHILADELPHIA ZOO CHAPTER-AAZK". THE DEADLINE FOR REGISTRATION IS MONDAY, AUGUST 15TH, 1983.

HOTEL RESERVATION REQUEST

University City Holiday Inn, 36th & Chestnut Streets
Philadelphia, PA 19104

ORGANIZATION: _____

DATES OF CONFERENCE: _____

PLEASE CHECK BELOW THE TYPE OF ROOM YOU WISH TO RESERVE:

 SINGLE \$50.00 DAILY
(one person)

 TWIN/DOUBLE \$56.00 DAILY
(two persons)

Room Tax - 6%

\$6.00 charge extra, each person over
two in a room

ARRIVAL DATE _____ TIME _____ DEPARTURE DATE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TOTAL NUMBER OF NIGHTS IN HOTEL: _____

IF YOU WISH TO BE MATCHED WITH A ZOOKEEPER ROOMATE, YOU MUST GIVE THAT PERSON'S FULL NAME: _____

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ELEPHANT KEEPER...responsible for daily maintenance, handling and training of both African and Asian elephants. Requires two years of full-time experience working with elephants. Show experience desirable but not essential. Starting salary \$6.29/hr., plus benefits. Submit resume to Rick Barongi, Curator of Mammals, Miami Metrozoo, 12400 SW 152 Street, Miami, FL 33177.

ANIMAL KEEPER 1...requires driver's license, one year of paid experience in care and handling of a variety of animals OR 6 months' animal care experience in a zoological institution OR a BS in biology, zoology or related field. Salary \$12,714-\$13,712. Contact the Civil Service Commission of Baltimore, 111 North Calvert Street, Baltimore, MD 21202.

CURATOR/BIRDS & MAMMALS...requires advanced degree in animal science, wildlife management, zoology or related field with extensive knowledge of animal care facilities and operations. Must have established working relations with other zoos, including supervision of five or more employees in similar work environment for a minimum of three years. Salary \$22,00-\$34,500. Send resume, salary requirements and references in confidence to Personnel Director, Arizona-Sonora Desert Museum, Route 9, Box 900, Tucson, AZ 85743.

(The following "Positions Available" were sent directly to the editorial offices of AKF for inclusions in this section.)

SUPERVISORY KEEPER, CHILDREN'S ZOO...duties include husbandry of wildlife and domestic stock, coordination of presentations to zoo educators, management of sea lion exhibit. Degree in biological sciences or animal husbandry and zoo experience required. Complete information on position available from Herb Emmerson, Director, The Utica Zoo, Steele Hill Road, Utica, NY 13501.

REPTILE KEEPER...duties include husbandry of modest but growing herpetological collection, some care of birds, and diet preparation for general collection. B.S. in zoology, practical experience and sincere interest in herp keeping (including venomous forms) are required. Complete information on position available from Herb Emmerson, Director, The Utica Zoo, Steele Hill Road, Utica, NY 13501.

STUDENT INTERNSHIP...available at the Animal Rehabilitation Center within the Conservancy Nature Center in Naples, FL. The Animal Rehabilitation Center (Project A.R.C.) is a community-supported program, where native injured wildlife are brought in for treatment, and released, if possible, back to their environment. Internship involves wildlife, as well as educational programs and special projects. Interns must be available for up to five months. Qualifications: a college student or recent graduate, studying wildlife or related field; some experience with people and animals; a sincere concern and interest in working with animals. \$55/week stipend, housing provided. Internships offered year round. To apply, submit resume, statement of goals and three references to: Julie Wasserman, Supervisor, Animal Rehabilitation Center, Conservancy Nature Center, 1450 Merrihue Drive, Naples, FL 33942, (813) 262-2273.

VETERINARIAN...position now open for full-time veterinarian familiar with zoological and domestic animals. Duties include complete management of zoo collection as well as management of veterinary hospital serving the community. Salary commensurate with experience plus percentage of profit. Send complete resume to Zoo Director Michael C. Verner, Long Beach Zoo, 2708 Seaboard Ln., Long Beach, CA 90805.

**o
p
p
k
n
o
c
k
s

i
t
y**

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

*Articles printed do not necessarily reflect the
opinions of the Animal Keepers' Forum editorial
staff or of the American Association of Zoo Keepers.*

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

Smithsonian Institution Libraries

Animal Keepers' Forum



Dedicated to Professional Animal Care

SEPTEMBER 1983

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Alice Miser
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614	<i>President</i>
Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112	
Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630	
Steve Taylor, Louisville Zoo, Louisville, KY 40213	
Connie Cloak, Topeka Zoological Park, Topeka, KS 66606	

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Turtle Back Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Biological Values Booklet</u>
<u>Bernie Feldman, Topeka Zoo</u>	<u>Mary Mure, San Francisco Zoo</u>
<u>Keeper Accommodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
	<u>Keeper Data Survey</u>
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Vacancy		ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D. C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Lawrence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's cover art is by Mike Turri who is a Bird Keeper at the Memphis Zoo and Aquarium. The drawing is of the first and only Black Rhino born at Memphis. The mother, "Snoopy" is now deceased and the baby, "Buck" is now at the Los Angeles Zoo. Thanks, Mike!

Scoops and Scuttlebutt

BIOLOGICAL VALUES AND GESTATION COMMITTEE MERGE

The Committee developing the booklet entitled "Biological Values for Selected Mammals" (which was recently published by AAZK) is proud to announce a merger with the Gestation Booklet Project headed by Mike Coker. The Committee would appreciate any interested parties supplying the information listed below on any mammal species with which they are familiar. (Source material used should be identified). This data will be utilized in the revision and publication of their 2nd Edition.

Name (Common and Scientific)
Range
Size (Male and Female)
Weight (Male and Female)
Estrus Cycle (Receptive Days, etc.)
Gestation
Litter Size
Weaning
Sexual Maturity (Male and Female)
Lifespan
Body Temperature
Respiration and Pulse Rate
Male, Female, and Young called

All responses will be gratefully acknowledged. Please send all correspondence and information to:

Mary Mure
c/o San Francisco Zoo
Sloat Blvd., at the Pacific Ocean
San Francisco, CA 94132

CHANGE OF ADDRESS REMINDER TO MEMBERSHIP

All AAZK members are reminded that it is VERY important that you notify National Headquarters directly when you are moving and changing your mailing address. Even though you may submit a change of address notification to the Post Office, it still costs AAZK 25¢ per item when the P.O. has to forward the address change on to us. Over a year's time those quarters really add up and this expense takes away from monies which could be spent on AAZK projects. We realize that you will not always have a lead time of a month or two to advise us of your address change. Address updates for AKF mailings are made the last week of each month, so if you find you are going to have an address change, please try to let us know either by mail or a phone call by that week.

Births & Hatchings

BROOKFIELD ZOO.....*John S. Stoddard*

July 1983 B&H at Brookfield Zoo include: Mammals - 0.0.7 White-toothed shrew, 0.0.2 Peromyscus, 0.0.2 Angola goat, 0.1 Milking shorthorn cow, 1.0 Beisa oryx, 0.2 Greater kudu, 0.0.1 Talapoin monkey, 0.0.1 Capuchin monkey, 0.0.1 Guinea baboon; Birds - 0.0.3 Flame-faced tanager, 0.0.1 Blue-grey tanager, 0.0.1 Purple honeycreeper, 0.0.1 Roul-roul, 0.0.1 Inca tern, 0.0.2 Red and white crake, 0.0.3 Redhead duck; Herps - 0.0.10 Arrow poison frog and 0.0.1 Hingeback tortoise.

LONG BEACH ZOO.....*Victor Pant*

The Long Beach Zoo's births and hatchings for June and July 1983 include: 4 Chinchilla, 8 Opossum, 10 French lop rabbits, 9 Beveren rabbits, 1 Moustache parakeet, 2 Jenday conure, 4 Crimson rosellas, 2 Pied cockateils, 2 Grey cockateil (DNS), 60 Zebra finch, 12 Ribbon snake, 1 Banded gecko, 25 Corydoras, 16 Black mollies and 200+ Black widow spiders.

BUSCH GARDENS.....*Sandy Moher*

The following are the B&H from Busch Gardens for June 1983: Mammals - 5.4 Impala, 1.1 Reticulated giraffe, 1.0 Dorcas gazelle, 2.0 Scimitar-horned oryx, 0.1 Soemmering's gazelle, 0.0.1 Panamanian douroucoulis, 0.1 Sand gazelle, 1.0 Kirk's dik dik, 1.1 Thomson's gazelle, 1.1 Grant's gazelle, 0.1 Defassa waterbuck; Reptiles - 0.0.16 Nile crocodile; Birds - 0.0.1 Black vulture, 0.0.3 Scarlet macaw, 0.0.3 Black swan, 0.0.4 Ringed teal, 0.0.6 Sun conure, 0.0.7 Mandarin duck, 0.0.2 Paradise shelduck, 0.0.5 Blue and gold macaw, 0.0.18 American flamingo, 0.0.3 Cockatiel, 0.0.3 Redhead duck, 0.0.1 Greater Sulphur-crested cockatoo, 0.0.1 Red-crested touraco, 0.0.3 Jandaya conure, 0.0.7 Scarlet ibis, 0.0.1 Wattled curassow, 0.0.2 Mitred conure, 0.0.1 Abdim's stork, 0.0.2 Hyacinthine macaw, 0.0.7 Indian peafowl (blue phase), 0.0.3 Severe macaw, 0.0.1 Illiger's macaw and 0.0.1 Noble macaw.

The month of July 1983 produced the following B&H: Mammals - 11.5 Defassa waterbuck, 5.6 Thomson's gazelle, 1.0 Soemmering's gazelle, 1.4 Impala, 0.1 Gemsbok, 1.0 Blesbok, 1.0 Addax, 0.1 Scimitar-horned oryx, 0.0.1 DeBrazza monkey, 0.1 Cape buffalo, 0.1 Roan antelope; Birds - 1 Red-tailed black cockatoo, 15 Indian peafowl (Blue Phase), 2 Indian peafowl (White Phase), 1 Green-winged macaw, 4.3 Chilean pintail, 1 Red-rumped parrot, 2 Redhead duck, 3 American flamingo, 5 Scarlet ibis, 2 Timneh parrot, 1 Cockateil, 1 Pied cockateil, 4 Ringed teal, 3 Hahn's macaw, 2 Eyton's tree duck, and 1 Sun conure.

LINCOLN PARK ZOO.....*Randy McMahon/Susan Moy*

The following are the B&H at Lincoln Park for July 1983: Mammals - 0.0.1 Senegal galago (DNS), 0.0.2 Moustached tamarin, 0.0.1 Geoffroy's tamarin, 0.0.3 Owl monkey, 0.0.2 Capybara (DNS), 0.0.2 Short-tailed fruit bat, 0.0.3 Snow leopard (1 stillborn); Birds - 0.0.16 Ruddy duck (15 DNS), 0.0.10 American redhead (2 DNS), 0.0.1 Blue-wing teal, 1.0 Andean condor (DNS), 0.0.2 Double-striped thick-knee (1 DNS), and 0.0.1 Plush-crested jay.

MILWAUKEE COUNTY ZOO.....*Steven M. Wing*

July B&H at Milwaukee County Zoo include: Mammals - 0.0.1 Indian fruit bat (DNS), 0.0.3 Common marmoset, 1.0 Mandrill baboon (DNS), 0.0.1 American elk; Birds - 0.0.3 Laughing gull.

BIRTHS AND HATCHINGS, Continued

MEMPHIS ZOO.....*Robert Evans*

The recorded B&H for July 1983 include: Mammals - 0.1 Black-backed duiker, 1.0 Wisent, 1.0 Bontebok; Birds - 0.0.1 Chattering lory, 0.0.2 Green-backed heron, 0.0.6 Peachick, 0.0.2 Ringed teal, 0.0.4 Red-billed hornbill, 0.0.3 Golden-mantled rosella; Reptiles - 0.0.1 Leopard gecko.

WOODLAND PARK ZOOLOGICAL GARDENS.....*Mary Bennett*

B&H for May and June 1983 include: 0.0.5 Snowy owl, 0.0.4 Common shoveler, 0.0.6 Satyr tragopan, 0.0.1 Bandtailed pigeon (DNS), 0.0.5 Lesser Bornean crested fireback (0.0.1 DNS), 0.0.2 Small-billed tinamou (DNS), 0.0.9 Blue-winged teal (0.0.3 DNS), 0.0.5 Muscovy duck, 0.0.2 Moluccan radjah shelduck, 0.0.8 Black-necked stilt, 0.0.1 Nicobar pigeon, 0.0.2 Potoroo, 1.0 Common pintail, 0.0.1 Rothchild's mynah, 0.0.4 North American black duck (0.0.1 DNS), 0.0.2 Humboldts penguin (1 DNS), 0.0.5 Common gallinule (1 DNS), 0.0.3 Common pintail (2 DNS), 2.1.1 Hooded merganser (0.0.1 DNS), 0.0.2 White-cheeked touraco, 0.0.1 Red-vented bulbul, 0.0.15 Wood duck, 0.0.2 Paradise shelduck, 0.0.2 Chaffinch, 0.0.6 Bufflehead, 0.0.7 Egyptian goose; 0.1 Angolan springbok, 1.1 African crested porcupine, 1.2 Roosevelt elk, 2.1 African lion, 0.0.2 Patas monkey, 0.0.2 Vampire bat (DNS), 0.0.4 Patagonian cavy, 2.1 Sika deer, 1.3 Mountain goat, 1.2 Springbok, 2.0 Bison, 0.0.2 Pygmy marmoset (1 DNS), 1.0 Damara zebra; 0.0.2 Leopard gecko and 0.0.2 Green & black arrow poison frog.

BRONX ZOO.....*Margaret Price*

B&H for July 1983 at the Bronx Zoo include: Mammals - 2.0 Lesser galago, 2.0 Large Malayan mouse deer, 3.0 Formosan sika deer, 4.0 Thomson's gazelle, 1.0 American bison, 3.0 Barasingha, 4.0 African spotted grass mouse, 1.0 Guanaco, 1.0 Himalayan tahr, 1.0 Lesser spear-nosed bat, 1.0 Douroucoul, 1.0 Degu, 1.0 Nyala, 1.1 Grevy zebra, 0.2 Axis deer, 2.0 Blackbuck, 1.0 Lesser long-tongued bat, 1.0 Saddleback tamarin, 1.0 Squirrel monkey; Birds - 1 White-naped crane, 2 Mandarin duck, 4 Red-crested cardinal, 2 Black-winged stilt, 1 Hooded crane, 3 Lilac-breasted roller, 4 Crested tinamou, 2 White-quilled black bustard, 1 Satyr tragopan, 1 Silver gull, 1 White-browed robin, 2 Red and white rail, 2 Mauritius pink pigeon, 2 Scarlet ibis, 4 Ringed teal, 6 Rosy-billed duck, 5 American ruddy duck, 1 Caribbean flamingo, 1 Chilean flamingo, 2 American barn owl; Reptiles - 1 Cuban crocodile.

METRO TORONTO ZOO.....*Marilyn Cole & Neville H. Pike*

Our most notable birth recently has been that of a lowland gorilla on 18 May, 1983 to Caroline (father probably Barney), who is caring for the infant quite well, if not quite in an orthodox manner. She has developed her own methods for holding the infant and tends to place it beside her more than is common, but otherwise cares for its needs and is very affectionate towards it. We believe the infant is a female, but Caroline has not allowed us as yet to get too close.

On a sadder note, the gorilla Josephine gave birth to a stillborn infant a few weeks after Caroline. This was Jo's second baby (her first was Tabitha who made medical history by being the first gorilla ever to be operated on by a neurosurgeon to remove a brain abscess). Josephine lovingly cared for the dead infant (a male) for four days before she finally was persuaded to let it go. She now shares an exhibit with Caroline, and from time to time has an opportunity to hold Caroline's infant. We are still awaiting the birth of at least one more gorilla, and hope that all will go well.

BIRTHS AND HATCHINGS, Continued

B&H through 31 May 1983 include: Mammals - 0.0.2 Sugar glider, 2.3 Bennett's wallaby, 0.0.8 Egyptian fruit bat, 0.0.2 Black lemur, 0.0.2 Common marmoset, 0.0.1 Patas monkey, 0.0.1 Japanese macaque, 0.0.1 Barbary ape, 0.0.1 Lowland gorilla, 0.0.7 Arctic wolf, 0.0.1 Kusimanse, 3.0 Snow leopard, 0.0.2 Damara zebra, 0.1 Malayan tapir, 0.1 Llama, 1.1 Reeve's muntjac, 1.0 American elk, 1.1 Moose, 3.2 White-tailed deer, 1.0 Eurasian reindeer, 1.0 Caribou, 1.0 Wood bison, 0.1 Domestic yak, 0.2 Sable antelope, 1.1 Gemsbok, 9.8 West Caucasian tur, 1.0 Himalayan tahr, 5.3 Dall's sheep. 6.2 Mouflon; Birds - 0.0.3 South African ostrich, 0.0.6 Mandarin duck, 0.0.6 Australian wood duck, 0.0.6 Ring-necked dove, 0.0.2 Black-necked swan, 0.0.4 South African yellow-billed duck, 0.0.5 Wild turkey; Fish - 0.0.4 Australian rainbow fish.

B&H for June 1983 at Metro Toronto include: Mammals - 0.0.6 Kowari, 0.0.4 Sugar glider, 2.0.3 Egyptian fruit bat, 0.0.2 Ring-tailed lemur, 0.0.5 Common marmoset, 0.0.1 Hamadryas baboon, 1.0 Lowland gorilla, 0.0.1 Mara, 1.0 South African fur seal, 0.1 Reeves muntjac, 0.1 Northern Indian barasingha, 1.0 Manchurian sika deer, 1.1 American elk, 4.4 Black-tailed deer, 2.6 White-tailed deer, 1.1 Woodland caribou, 2.0 Wood bison, 8.3 Himalayan tahr and 0.2 Mouflon; Birds - 0.0.2 South African ostrich, 0.0.1 Black-footed penguin, 0.0.1 Sacred ibis, 0.0.1 American flamingo, 0.0.9 Marbled teal, 0.0.7 Hooded merganser, 0.0.6 Indian peafowl, 0.0.12 Wild turkey, 0.0.1 Spur-winged goose, 0.0.2 Zebra dove, 0.0.4 Ring-necked dove, 0.0.2 Western Rosella and 0.0.1 Black-winged mynah; Reptiles - 0.0.1 Helmeted turtle; Amphibians - 0.0.11 Bell's horned frog; Fish - 0.0.5 White Cloud Mountain minnow.

DALLAS ZOO.....Tami Jones

B&H for July 1983 at the Dallas Zoo include: Mammals - 0.1 Patas monkey, 1.1 Red Panda (DNS), 0.1 Addax antelope, 0.0.2 Red Kangaroo (DNS), 1.0 Cape buffalo, 1.1 Barbados sheep, 0.1 Nile Lechwe, 0.1 Klipspringer, 0.1 Bongo, 0.0.1 Cavy, 0.0.1 Two-toed sloth, 0.0.1 Black and white colobus, 0.1 Kudu; Birds - 4 Spur-winged lapwing, 1 Red-billed whistling duck (DNS), 2 Society finch, 1 Ceylon junglefowl, 1 Oriental turtle dove (DNS), 3 Fulvous whistling duck; Reptiles - 14 Pueblan kingsnake (Lampropeltis triangulum ssp.), 8 Green eyelash viper, 4 Yellow eyelash viper (Bothrops schlegelii), 7 Ornate cantil (Agkistrodon bilineatus taylori), and 1 Cretin viper (Vipera lebetina schwiezer).

SAN DIEGO ZOO AND WILD ANIMAL PARK.....Jody Courtney

Selective B&H from the San Diego Zoo and Wild Animal Park for the months of June and July 1983 include: 0.1 East African bongo, 1.0 California sea lion, 0.0.1 Northern douc langor, 0.1 Bairds tapir, 2.2 Asian lion, 0.1 Slender-horned gazelle, 1.1 Barasingha deer, 1.0 Persian onager, 0.1 Transcaspian kulan, 0.1 Baringo giraffe, 0.0.1 Galapagos tortoise, and 1.0 Indian gaur.

The Wild Animal Park sent three Arabian oryx (3.0), which were born in 1982, as a gift to the government of Oman.

Four hatched California condors are doing fine. They have been sexed as 1.3. Eight California condors are now in captivity. There are four at the Wild Animal Park, and four at the Los Angeles Zoo. There are estimated to be no more than nineteen of these birds left in the wild.



Letters To The Editor

To the Editor:

I am writing in reference to the cartoon printed in the July edition of Animal Keepers' Forum, "The Zoo System" (Page 213), by Alan Sharples of the Atlanta Zoo. My views, and I feel the views of the majority of keepers, do not reflect the views of Mr. Sharples's on the zoo system.

We as members of AAZK need not muddy our reputation with such biased reflections.

I feel keepers are the foundation of the zoo but it takes the combined efforts of the entire zoo staff, from the zoo director on down, to make the zoo great. I am sure you will agree it takes the combined efforts of everyone involved in the AAZK to make it the fine organization it is today.

Sincerely,

Joe Grubic, Keeper
Central Texas Zoo
Waco, TX 76708

(Editor's note: the following response was received from Alan Sharples concerning the above letter from Joe Grubic. Contributors to and readers of AKF are reminded that articles printed in AKF do not necessarily reflect the opinions of the AKF editorial staff or of the American Association of Zoo Keepers. The goal of our editorial policy is to provide an open forum for input by the membership.)

To the Editor:

Indeed, my cartoon could not reflect the views of all keepers. However, if one removes the humor from our daily activities one could become so serious that nothing is ever humorous. Humor does not detract from a great zoo, it only improves its quality.

Sincerely,

Alan Sharples, Keeper
Atlanta Zoo
Atlanta, GA



Keeper's Alert

RIVERBANKS ZOO CHAPTER PLANS AAZK REGIONAL

The Riverbanks Chapter (Columbia, SC) of AAZK will be hosting a South-eastern Regional AAZK Conference at Riverbanks Zoological Park on April 19, 20, and 21, 1984. Further information regarding this conference and a call for papers will appear in the October issue of Animal Keepers' Forum.

Coming Events

ELEPHANT BREEDING SYMPOSIUM

September 16, 1983

Portland, OR

Held at the Washington Park Zoo. For information, contact J. Marks Bieberle, Washington Park Zoo, 4001 SW Canyon Road, Portland, OR 97221, (503) 226-1561.

THE 1983 AAZPA ANNUAL CONFERENCE

September 18-22, 1983

Vancouver, B.C.

The theme for the conference is "Survival in the Eighties". Hosted by the Vancouver Aquarium. For registration and further information, contact Murray A. Newman, PhD., Director, Vancouver Aquarium, P.O. Box 3232, Vancouver, B.C., Canada V6B 3X8.

FOURTH ANNUAL ELEPHANT WORKSHOP

October 14-16, 1983

Kansas City, MO

Hosted by the Kansas City Zoo. To be held at the Sheraton Royal Hotel. For further information, contact Mike Blakely, Curator of Mammals, Kansas City Zoo, Swope Park, Kansas City, MO 64132 or call (816) 333-7406.

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Grand Rapids, MI

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Sacramento, CA

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

April 15-17, 1984

Omaha, NE

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 29-May 1, 1984

Philadelphia, PA



EXHIBIT DESIGN FORM PROJECT

Diane Forsyth, Akron Zoological Park, has offered to coordinate a project for AAZK on collecting exhibit design data. Since October, 1982, a form that would be used to collect such data has been reviewed by several Education Committee members and was submitted to the AAZK Board of Directors for their approval of it as an AAZK project. Approval has been granted and now the AAZK membership is being asked to provide additional information before the form goes into final draft. Here again, you are being asked not to procrastinate. The Exhibit Design

Form will be available for review at the Philadelphia Conference; your input is important to this project. Please take a few minutes and answer the following survey ASAP---Thank you, Judie Steenberg, AAZK Education Committee Chairperson.

EXHIBIT DESIGN PROJECT SURVEY.....Diane Forsyth

I am in the process of developing a project for AAZK with Exhibit Design being the main emphasis. My project goals are as follows:

1. To make readily accessible information that heretofore was accessible only through tedious person-to-person research.
2. To create a form that will allow zoos to share their triumphs and mistakes instead of creating and recreating the same mistakes.
3. To assure a keeper's input on exhibit design by making the form a standard piece of equipment in each zoo's exhibit planning.
4. To tap the resource of keeper knowledge and insight by getting their opinions and suggestions.

I am interested in input from other keepers. Participation in this survey would allow for the creation of a project that could benefit us all.

1. When a new exhibit is created in your zoo, what input do the keepers get to contribute? _____

2. When an exhibit has been in use for a year, keepers often find problems they would like to see changed. Do these changes ever take place? How do you go about getting these problems changed? _____

3. Many exhibit considerations are not available in book form. Research has to be carried out by contact with other zoos. What types of information have you had to gather through phone calls and letters? _____

CONTINUING KEEPER EDUCATION, Continued

4. If a standard form is created to encompass all of these needs, in what format should these forms be distributed?

a. In a book form like the Infant Care/Diet Notebook AAZPA publishes? _____

b. Patterned after AAZK's Animal Data Transfer Form? _____

c. In a library system with a sponsoring zoo handling contributions of information and requests? _____

d. Other suggestions? _____

Name of contributing zoo: _____

Person completing survey: _____

Please return to:

Diane C.M. Forsyth
c/o Akron Zoological Park
500 Edgewood Ave.
Akron, OH 44307 (216) 375-2298

SFC/SUNY DEGREE PROGRAM

It is now possible to obtain a B.S. degree in Zoology, and an A.S. in Biological Parks Training through a combined program at Santa Fe Community College, Gainesville, FL, and the State University of New York College at Oswego, NY. The combined program involves a total of five years of study with students spending approximately five semesters at each institution. Students will spend the first two years at Oswego, and then transfer to Santa Fe. January 1984 is the starting date for the program. Interested parties should contact: Dr. Sigurd Nelson, Jr., Chairman, Dept. of Zoology, State University of New York College at Oswego, Oswego, NY 13126.



REVITALIZATION PLAN APPROVED FOR ATLANTA ZOO

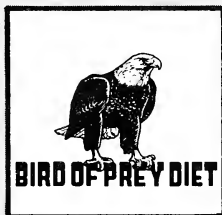
Submitted by Alan Sharples

On 23 June 1983, the City of Atlanta formally approved a plan for the revitalization and expansion of the Atlanta Zoo. The plan calls for natural habitat enclosures arranged on the zoogeographic/habitat format. Some of the exhibit groups are the Asian Highlands, Australian Grasslands, Okefenokee Swamp (native Georgia animals), Tropical Rainforests, Polar/Marine and an aquarium. Construction is expected to begin within one year of the approval date and take approximately five years from that date to complete. The estimated cost is \$25-30 million.

INTERNATIONAL FOODS COMPANY

offers
a full line of
PROVEN

Quality products for your feeding program



INTERNATIONAL FOODS COMPANY

P.O. Box 29345 • Lincoln, NE 68529

Call Collect: (402) 466-8271

Reptile Amphibian potpourri

CHELONIAN NUTRITION



By
Mark Adkins, Editor
Nebraska Herpetological Society Newsletter
Omaha, NE

A few key points in the healthy maintenance of any animal are: adequate housing, suitable environment, proper hygiene, good medical care and the correct, nutritionally balanced diet.

Chelonians, that is, all turtle species, present us with three nutritional problems. They can fast for long periods of time without any ill effects; they can withstand minor inadequacies for years before becoming irreversibly ill, and they hide vast areas of their bodies which camouflage problems effectively. The basic stress of captivity (you would be stressed too, if you were kept in an artificial environment for years) is compounded by a poor diet, sometimes resulting in *Salmonella*, pneumonia, mouth rot and "acute, non-specific death." Other problems are direct-gout, diarrhea, constipation, goiter, puffy eyes, soft shell, starvation and obesity and are all directly diet-related and diet-cured.

Like all other animals, Chelonians have a basic requirement for balanced nutrition (USDA recommended daily allowances). They require vitamins -- A, B complex, C,D,E and K primarily; minerals--copper phosphorus and calcium and trace elements such as iodine. They also require a balance of carbohydrates, proteins, water, salt and so forth. Please notice the word "balanced". Too much vitamins, calcium, phosphorus, water, salt, iodine, copper, food, sun etc. is just as bad and dangerous as is too little. In most cases, use your supplements sparingly, only a few times a week. Trust your basic diet regime to provide most of the nutrients.

Possibly the most delicate balance is the ratio of calcium to phosphorus, the "Ca:P" balance. Calcium is required by all animals with skeletons to produce bones. Too much calcium and bones overgrow and become brittle, too little and they deform and weaken. Too much phosphorus softens bones and retards growth and too little makes bones brittle and so on. In a week's time your animals (of any type) should receive as much calcium in its diet as it does phosphorus. Meat and lettuce contain a balance of about 1(Ca) 40(P), so should not be fed often, or balance with a high calcium food like egg shells, unflavored gelatin, alfalfa and so on. Bone meal has a 1:1 or so balance, so is an excellent additive.

Providing a balanced yet tasty meal is simple, if broken down into three steps:

(1) Provide a sound base - find a cheap, easy-to-store foodstuff that contains a balanced nutritional content. This should form about half of the animal's diet.

(2) Provide nutritional supplements in the form of vitamin powders, calcium/copper blocks, drops, medicinal supplements, etc. to the food or water; and

(3) Provide an amount of tasty "bulk". Food the animal likes eating and can be used as a "treat". Note: If the food has drastically bad nutritional balance, it must be offset soon--if it is low in iodine, feed a high-iodine food the next meal, etc. **WATCH YOUR BALANCES.**

CHELONIAN NUTRITION, Continued

Now, on to the animals. Chelonians can easily be divided into four groups:

HERBIVORES - includes the tortoises and many aquatic species. These chelonians eat primarily plants. They may eat an occasional insect and some carrion, but they do not actually hunt them. A good maintenance diet can consist of pelletized food such as that for monkeys, guinea pigs, rabbits, horses, sheep, etc., or pelletized or cubed alfalfa hay, assorted sprouts, thawed frozen mixed vegetables or a salad mix of chopped oranges, bananas, apples, yams, carrots, hard-boiled eggs, lettuce, kale and parsley. "Treats" can be almost any plant material (veggies, fruit, cacti pods, melons, hay, berries, flowers, etc.) bread, fungi, and so forth. Remember that red and yellow colors attract turtles and tortoises.

CARNIVORES - includes many turtles like grown Emydidea, snappers, etc. These animals do best on a meaty, high protein diet, but still require some vegetation (usually present in the stomach of the prey). Dog or cat food (canned or dry), trout food, hamburger, chicken, fish (live or frozen) or any organ meats. All raw meats, including organ meats, should be fed rather sparingly, with lots of vegetables or fillers to avoid gout. Treats for these animals can be insects, baby mice, fresh meat, peanut butter, cottage cheese, etc.

OMNIVORES - are most turtles. These animals eat pretty nearly ANYTHING! Most Emydidea are in this group. A good maintenance diet would include something from both of the above groups, or the following recipe:

1 ltr. unflavored gelatin
50 gr. trout chow

30 gr. high protein dry
bread cereal

Approx. 25-30 gr. chopped alfalfa or parsley,
vitamin supplements as required.

Fix the gelatin as directed, wash the rest of the items together and mix into gelatin. (Can be frozen in ice cube trays to provide controlled serving sizes.) Freezes or refrigerates well.

(Editor's Note: the preceding article was originally published in the Turtle Trust Occasional Papers (#12) and is reprinted here with the permission of the editor and the author. Turtle Trust is a charitable trust for the protection of turtles especially through captive breeding. Further information may be obtained by writing: Turtle Trust, Westport Point, MA 02791.

Information Please



Information is sought on white-cheeked gibbon (Hylobates concolor) exhibits. The National Zoo has proposed a new walkway through the park with several new exhibits, one of them being for gibbons. We would appreciate any information, pictures or suggestions on already existing displays, or ideas you might have on a new enclosure for this species. Please send any information to: Dianne Janczewski, Primate Division, National Zoological Park, Washington, D.C. 20008.

GOLDEN EAGLE RELEASE PROJECTS IN U.S. -- information is requested by the Roger Williams Zoo on any Golden Eagle release programs in the U.S. We are happy to announce the birth of Golden Eagle chicks every year for the past three. My hope is that we can start to release these babies back into the wild. In 1981 we produced 2 offspring; 1982-three offspring, and 1983-1 offspring. Please send any information on such release programs to: Liz McLaughlin c/o Roger Williams Park Zoo, Roger Williams Park, Providence, RI 02905.

Book Review



The Life of Plants

By E.J.H. Corner, 1964; Reissue 1981
Published by The University of Chicago Press,
5801 Ellis Ave., Chicago, IL 60637
330 pgs., paperback

Review by S. Ellis

The Life of Plants by E.J.H. Corner is not a new book. When it first appeared in 1964, critics hailed Corner's approach to botany as both original and artistic. Much of the same praise is still warranted eighteen years later with this 1981 paperback version. The language is still rather artistic and flowing when compared to other current botany texts. Corner's book is not complicated or highly technical, but a good knowledge of basic biological principles and some previous work in botany is essential to fully appreciate and follow Corner's explanations.

The theme of The Life of Plants is how plant life evolved and adapted to an aquatic environment and how these adaptations were further modified to accommodate terrestrial life. Corner uses many examples of actual plants to illustrate his points. Unfortunately, these occasional lists of scientific names have little meaning because most of the named species aren't pictured. One must look elsewhere to find the structures Corner is referring to.

There are some drawings and photographs in Corner's book. The photographs are in black and white. This is unfortunate because a dense growth of brown seaweed on the ocean coastline just looks like grey and black goo. Other photographs come off only a little better. The drawings, being simpler, are more suited to lack of color but they too have their shortcomings. Many of the drawings are of internal or specialized plant structures. Unfortunately, the various parts of the structures are not indicated or labeled although they may be referred to in the caption or text.

Last, but not least, the age of the book must be brought up; or rather, the republication of this book without any revisions or additions of newer material. There isn't even a forward indicating this is a republication. The most glaring omission due to age concerns the fungi. The Life of Plants contains two full chapters on fungus. Corner is a mycologist and he wrote eloquently on fungus in 1964. However, newer thought and research indicates that the fungi might better be classified in their own Kingdom since they have almost none of the cellular, reproductive or life history characteristics of other plants. Most botanists agree with this today or at least acknowledge this school of thought. Of course, Corner's book, in this reissued version, completely omits these ideas.

The Life of Plants is pleasurable to read and, if one keeps its shortcomings in mind, can be a valuable tool to the study of botany. For facts or explanations of biological principles, get a current text. To add interest or find good examples of principles, consult Corner's book.



One call does it all!



Quality Assured Diets
That Have
Constant Formulation
For
Balanced Nutrition
And
Economical Feeding

Frozen Feline Diets
(Horsemeat or Beef)
Frozen Bird of Prey Diets
(Fine or Coarse Grind)
Frozen Canine Diet
Chunk and Chopped Horsemeat,
Hearts, Livers, Rib, Shank and
Knuckle Bones

**TOLL FREE
(800)**

228-4005

In Nebraska, call collect
(402) 488-6492

Zu/Preem

Feline Canned	Ratite Dry
Primate Canned	Omnivore Dry
Marmoset Canned	Primate Dry

Animal SPECTRUM Inc.
5801 Locust Street
Lincoln, Nebraska 68516



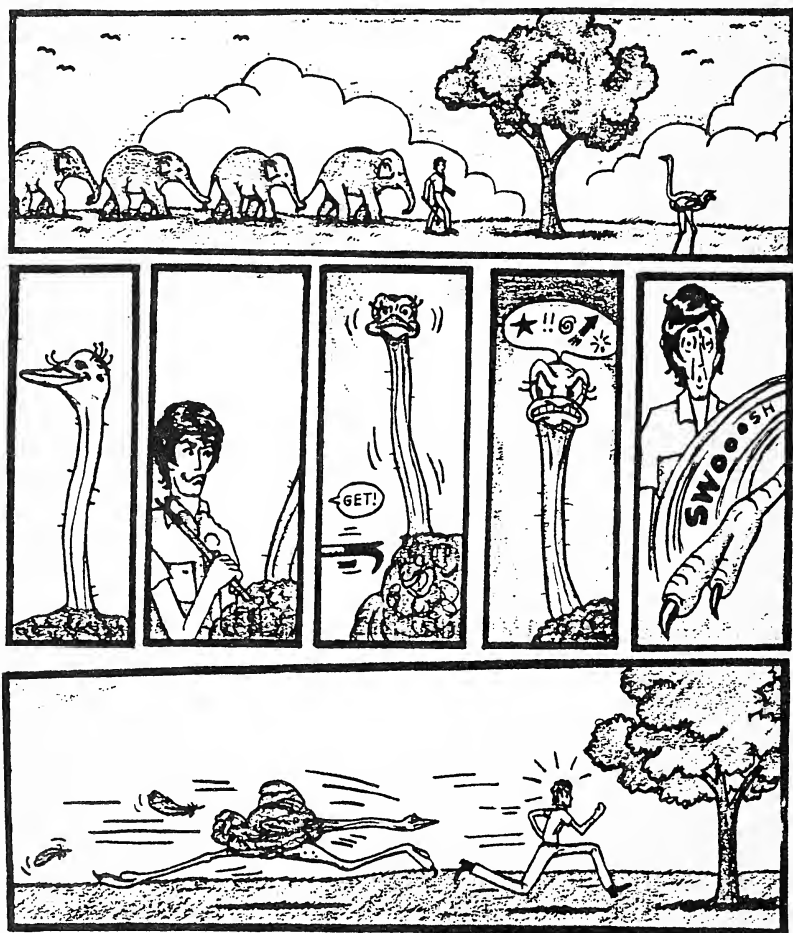
SPECTRUM

Banana Flavored Primate
(15% Protein)
Banana Flavored Primate
Pro-Plus
(25% Protein)
Omnivore Dry
Polar Bear Dry
Canine Dry
Ratite Dry
Hoofstock Supplement
(with Selenium)

THINK Safety!

This cartoon is one of seven created by Busch Gardens' artist Lynn Ash. The original dialogues have been changed to convey a different safety message in each cartoon. The messages may seem simple enough, but keep in mind that the incidents depicted actually happened: practicing safety looks easier than it is. Pass on the message in this cartoon by posting it in your zoo breakroom--let's help remind each other to "THINK SAFETY".

---Jill Grade
Keeper Safety Committee



THINK SAFETY -
USE THE PROPER EQUIPMENT FOR HANDLING
YOUR ANIMALS.

FORMING A CHAPTER AT
LAFAYETTE ZOOLOGICAL PARK

By
Louise La Roche
Primate Keeper
Lafayette Zoological Park
Norfolk, VA

The Lafayette Zoological Park Zookeepers began discussing the possibilities of forming an AAZK Chapter during the summer of 1981. We finally became organized enough to hold a meeting during December of that year. Officers were elected, the Malayan Sun Bear (*Helarctos malayanus*) was chosen as our logo and different fund-raising ideas were discussed. We were all enthusiastic and had thousands of ideas we wanted to begin implementing immediately.

Our second meeting was more realistic. We have a small membership with only 7-10 active members. At the time, our Zoo was undergoing many staff changes. Our Acting Director was supportive, yet questioned the need for a chapter. He encouraged us to "prove" ourselves and to develop chapter goals. The goals we set included furthering the education of the Keepers and the public; to make the public aware of the Zoo and the responsibilities of the Keepers; and to promote conservation.

We planned a "Spring Arts in the Zoo" to encourage the public to visit the Zoo and to begin raising funds for the Chapter. We had little idea of what it would involve, but everyone chipped in and we managed a fantastic show. The attendance at the Zoo was unbelievably high and Keepers and artists alike had a great time. "Spring Arts in the Zoo" has become an annual event and one of our biggest.

The second large fund-raising and public awareness project was a birthday party for our best known Zoo character, Chuck the Chimpanzee. We sold Chuck the Chimp tee-shirts, birthday cake, had several City officials speak, unveiled future plans for our Chimpanzee-Baboon exhibit, and showed a National Geographic film on Jane Goodall's Chimpanzees. A local nightclub honored Chuck with a party and sold glasses of champagne for 25 cents. All proceeds, approximately \$250, were donated to the Chapter. Now, that's a lot of champagne! Local media covered the event before and during which helped out tremendously. This time, we were organized and everything went smoothly.

By August, the Chapter treasury held approximately \$900. We have since bought an acre of land in LaPlanada, a tropical rain forest in Columbia and assisted in sending a representative to the National AAZK Conference in Toronto. We have sent donations to the World Wildlife Fund to help their campaign against countries which may refuse to comply with the whaling ban. We have purchased a 33mm Canon camera with standard lens, zoom lens, and a flash, in hopes of recording special events at the Zoo. The chapter nominated and paid dues for an honorary membership to National AAZK every year. Mr. Shurl Montgomery, Director of Parks & Recreation, was elected last year, and Mr. Larry Zehnder, Assistant Director of Parks & Recreation, and our Zoo's Acting Director for 7-8 months was elected this year. We hope to encourage their interests and support in the Zoo and our Chapter.

We have begun showing wildlife/conservation films at our monthly meetings.

FORMING A CHAPTER AT LAFAYETTE ZOOLOGICAL PARK, Continued

These films are borrowed from the Virginia State Library and the only cost required is for return postage.

On 25 February, 1983 - 6 March, 1983, we put together a program to recognize "International Day of the Seal". Donations were collected for the Seal Rescue Fund and a display of different seals and sea lions were exhibited. Free information was made available to the public on Marine Sanctuaries and the Seal Rescue Fund.

Our Chapter took a field trip to the Williamsburg Busch Gardens Zoo Department. Their Keepers took us on a behind-the-scenes tour of their operation. It was an enjoyable and informative trip.

Our future plans include a trip to the Front Royal Conservation and Research Center in Virginia, a slide show of our Zoo, and educational talks to the public.

We have come a long way since our first meeting. Local business and area media have contributed greatly to our success. Our Chapter has had its share of problems, but we feel we have accomplished a great deal for the Zoo and for ourselves. It has promoted ties between Keepers and increased understanding and respect with upper management.

If your Zoo doesn't have a Chapter, we encourage you to form one. The rewards far outweigh the problems.



Publications Available

APPLIED BEHAVIORAL RESEARCH - edited by Carolyn Crockett and Michael Hutchins

This 1977 publication is still available, in limited quantity, from the Woodland Park Zoological Gardens. "The contents of this volume have their origin in a cooperative relationship between the staff of the Woodland Park Zoological Gardens and students and faculty from the University of Washington"; approximately 30 copies remain as of this writing. The cost is \$10.00 per copy which includes postage. This could be your last chance to obtain a copy of this unique publication. Orders will be filled on a first come, first served basis; check or money order payable to the Puget Sound Chapter of AAZK must accompany your order. Send to: Hank Klein, Puget Sound AAZK Chapter, Woodland Park Zoological Gardens, 5500 Phinney Avenue N., Seattle, WA 98103.

Recent Publications in Natural History -- a quarterly bibliography compiled in the Department of Library Services of the American Museum of Natural History, lists new scholarly publications in the natural sciences, anthropology, earth sciences, travel and expeditions, museology, reference, biography, the history of science and related subjects. Each issue includes worldwide coverage, including publications in any language from any country; 24 subject headings, with cross-references listed in all appropriate categories; a full bibliographic citation for each title, including the ISBN or ISSN and price when available; and scholarly book reviews. Subscriptions are \$10.00 per year (4 issues), by volume only. Outside U.S. add \$3.00 per year for each subscription. Subscribe now to the Volume 2 (1984) and receive a FREE subscription for Volume 1 (1983). Address subscription inquiries to: American Museum of Natural History, RPINH Subscriptions--Library, Central Park West at 79th Street, New York, NY 10024 USA.





SUCSESSES IN 1983 PANDA BREEDING OUTWEIGH DEATH OF CUB

By

Devra G. Kleiman

*Acting Assistant Director for Animal Programs
National Zoological Park, Washington, D.C.*

The year 1983 has brought double success to the National Zoological Park and its two giant pandas. On 18 March, Hsing-Hsing mated successfully with his mate for the first time. Ling-Ling became pregnant and gave birth to a single male cub at 3:18 a.m. on Thursday, 21 July. Since artificial insemination, using semen from Chia-Chia, the giant panda male in London, was carried out on the two days following the mating, the father of the infant is not known. The road to these twin successes has been uneven, with many frustrations and disappointments. However, each year we have increased our understanding of giant panda biology and eventually, I am sure, we will successfully raise a giant panda infant here.

The difficulties we have encountered have at times seemed like a soap opera. One year Ling-Ling sprained her foreleg early during the heat period, and could not stand when Hsing-Hsing mounted her. The following year, she weighed a plump 292 (she is now a svelte 235), and again seemed unable to stand while Hsing-Hsing mounted.

In 1981, the Zoological Society of London generously sent us their male Chia-Chia on a breeding loan. Ling-Ling and Chia-Chia were totally incompatible and fought during their first encounter, with Ling-Ling sustaining such serious injuries that we could not consider introducing her back to Hsing-Hsing or attempting artificial insemination.

Artificial insemination of Ling-Ling has been attempted three times, in 1980, 1982, and 1983. In 1980, we were clearly late in insemination, but many behavioral and hormonal changes in 1982 suggested that Ling-Ling might be (or might have been) pregnant, including nest-building activity, increased anogenital licking, and cradling of some food items such as apples. Indeed, Ling-Ling was cradling apples and carrots periodically from August until December 1982, as though she had been rearing a cub for several months.

The problems that the NZP has had in successfully breeding its giant pandas are not unique. Despite the existence of 50 to 60 giant pandas in Chinese zoos, only one or two litters are born and raised each year. The difficulties experienced in China include females who do not have heat cycles, females and males who are incompatible, and males who are uninterested or cannot mate. Indeed, in 1982 there was only a single male giant panda in captivity in China that would breed, and even he would only mate with a few selected females. One of the biggest obstacles to breeding giant pandas successfully is the brevity of the heat period and its infrequent occurrence. Giant panda females are reproductively active only for two to three days each year in the Spring.

Ling-Ling's heat period in 1983 occurred on March 18-20. In early July, results from hormonal assays of her urine being carried out by the New York Zoological Society indicated that she was probably pregnant. On 11 July, FONZ volunteers began a 24-hour watch, monitoring Ling-Ling with a closed-circuit TV system lent to us and installed by the National Geographic Society.

SUCSESSES IN 1983 PANDA BREEDING SEASON OUTWEIGH DEATH OF CUB, Continued

About 13 July, Keeper Leader Barbara Bingham noticed that Ling-Ling's nipples were visible. Several days before birth, encounters with Hsing-Hsing were terminated since Ling-Ling was becoming increasingly upset with and aggressive towards Hsing-Hsing. Finally, on 20 July in mid-afternoon, Ling-Ling began building a nest with bamboo in a corner of her indoor exhibit. That evening, starting about 7:00 p.m., she began anogenital licking. Through the rest of the night until the birth at 3:18 a.m. she was restless and showed frequent genital licking, occasional moaning vocalizations, and periodic contractions of her haunches and vulva.

Following the birth, Ling-Ling began exhibiting excellent maternal care once the infant vocalized and moved, including licking and gently cradling the cub in her arms. With no warning or indication of any problem, the infant ceased moving at 6:30 a.m. For the next 10½ hours Ling-Ling continued cradling, licking, and holding the cub, until at 5:00 p.m. NZP veterinarians Drs. Bush and Phillips retrieved the dead infant from Ling-Ling by distracting her and lassoing the infant using a noose on the end of a long pole. Ling-Ling immediately began cradling an apple and has continued since 21 July showing maternal behavior towards the apple.

The initial results of the autopsy suggest that the giant panda cub died of a fluid build-up in the chest cavity that was part of a generalized retention of fluid throughout the body. NZP Pathologist Dr. Richard Montali later reported that the cause of the baby panda's death was a bronchial pneumonia apparently contracted in the womb. The infection was caused by *Pseudomonas* bacteria, although how the infection occurred is not known.

This giant panda birth resulted from over ten years of intensive research on giant pandas by our staff and the numerous individuals and institutions with whom we have collaborated. The behavior studies would have been impossible without the dedication of the FONZ volunteers and collaboration with the New York Zoological Society and Museum Alexander Koenig in Bonn. The physiological studies and artificial insemination techniques have evolved with cooperation from colleagues of the National Institutes of Health, New York Zoological Society, Children's Hospital in Washington, DC, Zoological Society of London, Texas A&M University, and National Cancer Institute. Within NZP itself, the Departments of Mammalogy, Zoological Research, and Animal Health have always worked closely on the studies of giant panda reproduction and behavior.

During the day of the birth of the giant panda cub, many NZP and FONZ departments and individuals had to respond to special demands deriving from this unusual situation. Several individuals were called in between 4-6 a.m. for both real and anticipated needs. Everyone responded quickly and effectively, whenever asked. All told, the Zoo ran like a well-oiled machine, and I would like to express my gratitude for the flexibility and concern shown by the entire Zoo staff during this period. A special vote of thanks is deserved by the staffs of North Mammals, Zoological Research, Animal Health, Pathology, Public Affairs, NZP Police, and several departments in the Office of Support Services. FONZ staff and volunteers were also incredibly helpful.

We must now wait for Ling-Ling's next breeding period in spring 1984. However, our chances of having a cub successfully born and reared at the National Zoological Park in 1984 have increased dramatically since we now know that Hsing-Hsing can mate naturally, Ling-Ling can become pregnant, and Ling-Ling is as attentive and caring a mother as one could hope for.

from TIGERTALK
July 1983



Legislative News

Compiled by Kevin Conway
Legislative Coordinator

GREEN SEA TURTLE TRANSSHIPMENT REGULATIONS

On 4 May 1983, the Fish & Wildlife Service (FWS) published a proposed rule in the *Federal Register* to allow transshipments of certain green sea turtle products of the Cayman Islands Turtle Farm through the port of Miami. At present, import and export of commercial shipments of green sea turtle products is prohibited by regulations under the Endangered Species Act, regardless of final destination.

In this instance, the U.S. law is stricter than the CITES position. CITES includes an exemption to allow transshipments of listed specimens through a CITES Party nation, provided the specimens remain in Customs Control. In the CITES exemption, there is no requirement that the specimens be destined for a non-Party nation. This is because a nation may have taken a reservation to the species listing, and one country cannot dictate to another country how CITES should be enforced.

The Cayman Islands Government, on behalf of the Farm, requested that the U.S. amend its regulations similar to the CITES exemption. Miami is the most reliable transportation center in proximity to the Farm. Therefore, the current U.S. ban of transshipment effectively shuts the Farm out of most of the world markets. If the regulations are not amended, the Farm may be unable to continue its breeding program and operation.

The Farm representatives have consistently argued that termination of the operation would, among other things: (1) discourage others from developing captive breeding and ranching operations of sea turtles; (2) continue pressure on wild stocks to fill the demand for turtle products; and (3) stop valuable research which is necessary for the survival of the green sea turtle.

This regulation would be limited to transshipment of turtle products by the Farm, because the Cayman Islands Government has stated it will adopt restrictions to avoid abuses of such an exemption. A strict numbering and documentation system on traded items will be imposed.

The exemption is limited to shipments to a previously specified importer in a foreign country. The U.S. would not serve as a warehouse for green sea turtle products. In addition, prior to shipment, an agent of the shipper would be required to file several documents with FWS.

---K. Vehrs
AAZPA Newsletter
June 1983

OUTCOME OF CITES MEETING

The fourth meeting of the CITES parties was held in Botswana from 19-30 April. Although the official transcript of the meetings is not available yet, the following are some of the actions on resolutions of interest to AAZPA and AAZK members.

1. Guidelines for Transport

The International Air Transport Association (IATA) Live Animal Regulations will be deemed the CITES guidelines for air transport.

LEGISLATIVE NEWS, Continued

2. Animal Stressed During Transport

There will be a voluntary reporting system to report undue stress or injury to specimens shipped live. The report, written in a card affixed to the transport container, will be made to the Management Authority of the country who issued the CITES export or re-export permit.

3. International Regulations of Zoos and Similar Institutions

This proposal to establish a system of evaluation of zoos of the world failed.

4. United Kingdom Proposal Regarding Animals Bred in Captivity

This proposal to change the standards for animals bred in captivity failed.

---AAZPA Newsletter
July 1983

PETITIONS TO LIST GULF OF CALIFORNIA HARBOR PORPOISE

The National Marine Fisheries Service (NMFS) has received a petition to add the Gulf of California Harbor Porpoise (*Phocoena sinus*) to the U.S. List of Endangered and Threatened Wildlife. The petition presents substantial scientific information about any modifications of its habitat or range, overutilization, disease or predation, and man-made factors affecting its continued existence.

---K. Vehrs
AAZPA Newsletter
July 1983

INTERNATIONAL UNION LISTS ENDANGERED INVERTEBRATES

The International Union for the Conservation of Nature, a sister organization of the World Wildlife Fund, has listed 600 invertebrates as endangered species. Among the species listed were the following: the giant Gippsland Earthworm, which lives in Australia, is 13 feet long, and lubricates its way through burrows with a milky fluid said to relieve rheumatism; the No-Eyed Big Spider, which is found in caves on Kauai Island, Hawaii; the Lake Tahoe Stonefly, which spends its entire life in Lake Tahoe at depths of 200 feet; Queen Alexandra's Birdwing Butterfly, the world's largest with a wingspan of one foot, found in Papua New Guinea; the Wallace Giant Bee, the world's largest (one and a half inches long), found in Indonesia; the Coconut Crab, which weighs up to 11 pounds; the Giant Clam of southern waters, which has a diameter of four feet, seven inches and weighs more than 440 pounds; and the world's largest earwig, which measures three inches long.

According to the Union, there are 1.4 million known types of invertebrates and as many as 10 million other types of invertebrates could be living in the ocean depths and tropical forests. Their potential value to Humans may never be discovered because they are disappearing rapidly as a result of pollution, razing of forests, and the encroachment of people on their habitat.

---from ECOLOGY USA
July 4, 1983

MORE CALIFORNIA CONDOR CHICKS HATCHED

Three more California condor (*Gymnogyps californianus*) chicks hatched during April/May, two at the San Diego Zoo and one in the wild. This brings the number of chicks known to have been produced this spring (as of June 1) to five. Four of these chicks hatched from eggs collected under permit for captive breeding in the future.

Two condors had hatched earlier this season, and the third chick at the San Diego Zoo emerged from its egg on 25 May. Earlier, the sporadic incubation that the egg received from its natural parents before it was taken to the zoo was thought to have damaged its chances of hatching. A fourth chick hatched at the zoo 2 days later from an egg laid on 30 March and collected on 26 April. All four chicks are responding well to the care they are receiving from the zookeepers. A chick was hatched in the wild as well this spring, and is being raised by its natural parents. Further, another condor pair is incubating its third egg of the season in the first confirmed case of "triple clutching" by California condors. (The pair's first egg was one of those hatched at the San Diego Zoo, and its second egg became broken during incubation by the adult birds.)

One troubled California condor breeding pair lost both eggs last year during squabbles over incubation rights, and similar problems this spring led to the collection of its second egg for safe keeping at the San Diego Zoo. In an effort to gain some insight into the birds' puzzling behavior and to see if California condors will accept a chick placed into a nest, an Andean condor (*Vultur gryphus*) chick from the Patuxent Wildlife Research Center (PWRC) flock was substituted for the dummy egg that had been put in the pair's nest earlier. (An Andean surrogate was chosen for the experiment since 1) these birds are not as rare as the California condor, 2) PWRC works have shown that Andean condor pairs will accept artificially incubated eggs, and 3) they are already being produced in captivity. One day later, however, the Andean chick was nudged out of the nest during examination by an adult condor and rolled over a ledge. It was quickly taken to the San Diego Zoo where it seems to have recovered well.

---from *Endangered Species Technical Bulletin*
Vol. VII, No. 6

(Editor's Note: Watch for next month's *Animal Keepers' Forum* for a special California Condor Update feature. This piece will include the latest information on the San Diego Zoo's captive breeding efforts.)

WOODLAND CARIBOU PROPOSED AS ENDANGERED

The only population of caribou that still regularly occurs in the continental United States, sometimes known as the southern Selkirk Mountain herd, has been proposed by the USFWS for final listing as an Endangered Species. This very small herd is found only in parts of northeastern Washington, northern Idaho, and southern British Columbia, Canada. Although the population was designated Endangered on 14 January 1983, under the emergency listing authority in Section 4 of the ESA, that action was temporary and expired on 12 September 1983. The proposed final listing would give permanent protection to the herd.

It now appears that the southern Selkirk Mountain population of the woodland caribou (Rangifer tarandus caribou) has become the most critically jeopardized mammal in the U.S. In recent years, its numbers have declined to 13-20 animals, and the premature loss of a single individual could be disastrous to the herd. Currently the herd is threatened by: (1) logging of old growth forests that bear lichens, the major part of their winter diet; (2) vehicle collisions along forest roads; (3) illegal hunting; and (4) a lack of recruitment from other herds, which has caused the southern Selkirk Mountain population to suffer ill effects of inbreeding. Benefits to the herd of this listing would be to augment caribou conservation measures now being employed by the USFS, ensure that the needs of the caribou and its habitat are considered in Federal land-use planning, and strengthen law enforcement authority. Critical Habitat was not included in the proposal because publishing maps could make the herd more vulnerable to poachers; however, habitat of the herd will still receive protection under Section 7 of the Act.

---Endangered Species Technical Bulletin
Vol. VII, No. 7

FINAL RULE TO ALLOW PURCHASE, SALE AND BARTER OF CAPTIVE-BRED RAPTORS

On 8 July, in the *Federal Register* on pages 31600 to 31610, the FWS issued a final rule to permit raptor breeders and falconers to purchase, sell or barter certain captive-bred raptors in the U.S. and foreign countries. The rule outlines the conditions to exempt species listed as endangered or threatened from the Endangered Species Act prohibitions. The following is a summary of the rule:

- A raptor propagation permit is required before any person may take, possess, transport, sell, purchase, barter or transfer any raptor, raptor egg or raptor semen for propagation purposes.
- Applications for raptor propagation permits must be submitted to the Special-Agent-in-Charge.
- The application must contain information about the permit's purpose, the applicant's experience, the raptor to be transferred, and the facilities and equipment to be used.
- The Director of the Fish & Wildlife Service decides whether the permit should be issued according to established criteria.
- Documentation is required to exempt from the Endangered Species Act prohibitions a raptor listed as endangered or threatened. Only raptors or their progeny held in captivity or in a controlled environment on 10 November 1978 qualify for exempt status.
- A numbered non-reusable seamless marker must be attached to any captive-bred raptor possessed under a permit.
- A permittee may transfer, purchase, sell or barter any raptor banded with a numbered seamless marker to any person authorized to purchase, sell or barter captive-bred raptors, or to any foreigner authorized by their Wildlife Management Authority to possess, purchase or barter raptors. The recipient must be certified by the Management Authority.

---K. Vehrs
AAZPA Newsletter
August 1983



THE DIGIT FUND

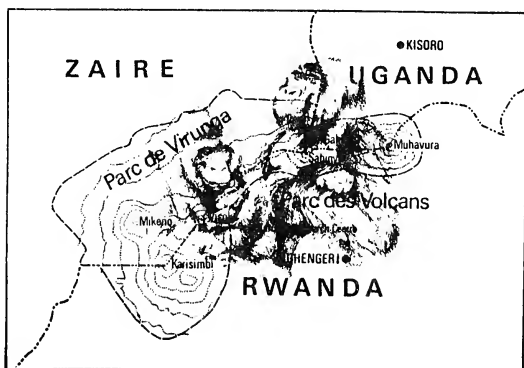
Will the Mountain Gorilla Survive?

By

Dian Fossey, Director
Karisoke Research Centre
Rwanda, Africa

As you possibly already know, in 1976 I established the Karisoke Research Centre in the Parc des Volcans in Rwanda. The camp lies at 10,000' in the heartland of the Virunga Volcanoes, the last sanctuary of the Mountain Gorilla, shared by the countries of Zaire, Uganda and Rwanda. I was selected for the long-term research by the late Dr. L.S.B. Leakey and financed by the National Geographic Society.

The research aims were dedicated toward long-term investigation of the behavior and ecology of the Mountain Gorilla, one of 3 sub-species of gorillas previously only studied by George Schaller in 1959-60. Much remained unknown about the magnificent apes. After several months of field work, I realized that research aims would have to be compromised with conservation goals if the Mountain Gorilla was to survive. Not only were poachers setting traps and killing game but literally thousands of cattle grazed illegally within the park rendering vast areas of vegetation unsuitable for gorilla, elephant, buffalo, and antelope. Most of these animals, particularly the reclusive gorilla, were being squeezed out of terrain legally set aside for them in 1925, and pushed higher and higher up into the alpine zones, up to 14,000 feet, of the Virunga Volcanoes--a desolate and bleak area.



Over a 5-year period, I managed to get rid of the cattle and was also able to habituate the Mt. Visoke gorillas to my presence. I had found four study groups totalling 47 individuals within a 4-mile radius of camp. The animals were difficult to habituate because they knew human beings only as poachers. To gain their trust was, undoubtedly, one of the greatest rewards obtained over the following 15 years of my research. Briefly, I should like to introduce you to the groups as they were when I first met them in 1967.

Group 8: This was an unusual group of five males and 1 female, about 60 years of age, who died of natural causes in 1968. Because no breeding opportunities were available in the group, 3 of the males emigrated to search for females on the northern slopes of Visoke to establish their own groups. The youngest male, Peanuts, remained with his father, Rafiki, (a Swahili word meaning 'friend'). Little Peanuts became the first free-living gorilla ever to reach out and willingly touch a human being when,

Note: Underlined gorilla names indicate individuals surviving as of Fall, 1982.

THE DIGIT FUND, Will The Mountain Gorilla Survive?, Continued

in 1971, he stroked my hand. During that fleeting second of communication, I felt as though a bridge spanning chasms of immeasurable time linked our two species.

Group 4: Sharing Group 8's range in 1967 was Group 4, a well-established group of 13 individuals led by an old silverback (any mature male over 13 years of age) named Whinny because his vocalizations sounded much like the whinnying of a horse. When Whinny died of natural causes in 1968, his young silverback son, Uncle Bert, took over the leadership of Group 4. Uncle Bert, so named because he bore a striking resemblance to a relative of mine, was eventually assisted in protecting the group against intrusion by both humans and male gorillas seeking to obtain females by a maturing male named Digit and an even younger male named Tiger. Digit acquired his name because of a broken middle finger, possible the result of a trap injury. Tiger, like Uncle Bert and Digit, had also been sired by Whinny and was named because of his flaming crown of reddish hair evident from the day of his birth in November 1967. On December 31, 1977, Digit sacrificed his life by taking five spear wounds into his body and holding off six poachers so that his family group might survive. The little ball of fluff that I had first met in 1967 was no more. Six months later Uncle Bert and 2 other Group 4 members were also killed by poachers. All that remained of this once prolific group were 3 young males, including Tiger. The four sexually mature females were taken by other silverbacks following the infanticide of their infants. Infanticide among gorillas is a process by which a sexually mature male must kill an infant in order to speed the mother's return to estrus so that he might breed with her himself. Poachers' spears, arrows, and bullets decimated Group 4 in July 1978. No gorilla group can exist without a silverback leader, and Uncle Bert, like Digit, was no more.

Group 9: Geronimo was the silverback leader of this fine group of 13 individuals whom I first met on Mt. Visoke's slopes in 1967. Group 9 was one of the first groups to move from the mountain slopes into the saddle area once it was cleared of cattle. The group then moved onto Visoke's northern slopes, far from the study area. When I last saw Geronimo in 1973 he was obviously quite ill though still trying to lead and protect a small group of 4 individuals. Eventually he must have died and what was left of his group dispersed to other breeding units.

Group 5: By far the most well established group on Mt. Visoke in 1967 was Group 5, then composed of 15 members and led by a wise older silverback I named Beethoven. The younger silverbacks in this group, named Brahms and Bartok, eventually left to establish their own ranges and families on Visoke's eastern slopes. Beethoven's harem of five females provided him with a total of 19 offspring, one of whom, Icarus, remained with the group because breeding opportunities were available. Icarus, much like Digit, was only a little ball of fluff when I first met him in 1967, but because his group ranges in safer areas than did Group 4, Icarus has been able to survive, assist his elderly father in the protection of the familial group, and has also sired four offspring as of the end of 1982. Beethoven remains the group's dominant male, not by means of force or violence, but simply because his mates of many years respect him, as do his offspring. His son, Icarus, will never attempt to eject the old man from the family group because of the extraordinary bonds of kinship ties in gorilla society.

Nunkie's Group: At the end of 1972 a grizzly old silverback male whom I did not know entered the study area probably from another mountain, Karisimbi, south of the camp. We will never learn what factors were responsible for bringing this older male to the study area. Nunkie, as he was named, did not stay lone for long. Within several years he had succeeded in acquiring 6 females from other Visoke groups and, by the end of 1982, had sired 10 offspring with his newly acquired harem. To

THE DIGIT FUND, Will The Mountain Gorilla Survive?, Continued

my sorrow, two of his daughters were victims of poachers. One suffered a slow, lingering death after being caught in a wire trap in the saddle area off of Visoke's slopes in 1978. Almost immediately afterward, Nunkie moved his group back onto the mountain's slopes where he has remained ever since.

END OF 1982 STATUS UPDATE

At the end of 1982, the total population of the current 3 main study groups is 34 individuals; however, including 4 lesser known fringe groups who are contacted fairly regularly around Visoke, but not habituated, the total study population count is 83. There is an adult male to adult female ratio of 1:1.3 and an immature (any animal under 8 years) to mature ratio of 1:1.2. These figures tell us that the Mountain Gorilla, at least within the more protected 25 km² Karisoke study region, are holding their own though certainly more adult females are required if the population is to expand. The average time between births is 41 months because of the long period of dependency of a gorilla infant upon its mother.

Peanut's Group; ex-Group 4: With the killing of Uncle Bert, Group 4's leader, 3 young males joined forces with Peanuts, the young silverback who had grown up in Group 8, another group extinguished because of the death of its silverback leader, Rafiki. By the end of 1982, Peanuts added 3 other animals to his group, but, sadly, they are all males. Tiger, whom I had met in 1967 as a little tadpole on his first day of life, has become a sexually maturing silverback and left Peanut's Group in 1981 to begin his lone quest for mates. Regretfully he remains unsuccessful and seems to delight in the company of familiar observers to relieve the tedium of his lonely days.

Group 5: This well-established group led by Beethoven and his son Icarus is the only one as yet unscarred by poachers. Beethoven's breeding days have probably ended as he now has only one mate, old Effie, mother of Icarus, who produced their sixth offspring, a female named Maggie, in December 1980. Additions to this family group will depend upon Icarus who currently has 3 younger females with whom to mate; his two full sisters, Puck and Tuck, and his half sister, Pantsy. For the sake of exogamy (outbreeding), it is hoped that Icarus will acquire a totally nonrelated female from another group. Because of the long duration of my study, the geneology of virtually all of the animals within the area is well known.

Nunkie's Group: Nunkie's tenth infant was born in October 1982 to Pandora, one of his harem of 6 females. Pandora is somewhat of a marvel. When she was acquired by Nunkie years ago, it was noted that her hands were extremely deformed, scarred and missing fingers. The most obvious reason for the gross deformities was that she had been a trap victim in her early years. I worried about her ability to care for an infant, however, she has proven an exemplary mother since December 1978 with her firstborn, Sanduku. Pandora has a great dignity of character as though the hardships she has undergone have strengthened her resolve to survive despite the odds.

The Digit Fund is a nonprofit, tax-exempt corporation established in 1978 for the support, contribution, and expansion of active conservation and research with the 240 Mountain Gorilla now remaining in Africa.

The Fund was established in memory of Digit, a gentle gorilla slain and decapitated by poachers on New Year's Eve day, 1977. The harmless Digit sacrificed his life by holding off six poachers and their dogs so that

THE DIGIT FUND, Will The Mountain Gorilla Survive?, Continued

his own family's group of ten members might flee to safety high into the mountains of the gorillas' habitat. Digit's last battle had been a valiant and courageous example of the altruistic nature of the gorilla.

Digit's group survived for only six more months until poachers struck again, this time with guns instead of spears, bow and arrows. Five more gorillas were killed, including Digit's one and only offspring whom I had named Mwelu, an African word meaning 'a touch of brightness and light', a light irrevocably extinguished by a single bullet.

Following the publicity of the gorilla slayings, numerous gorilla conservation projects sprang into existence, but the Digit Fund is the only organization actively dedicated toward anti-poacher patrols within the heartland of the 375 km² parklands where Mountain Gorilla remain, a small refuge shared by three countries - Zaire, Rwanda and Uganda. Other Mountain Gorilla conservation projects are theoretically inclined to feel that their funding and efforts should be directed toward the promotion of tourism and the expansion of facilities located outside of the park. The remaining 240 Mountain Gorilla, a population reduced by 50% in the last 20 years, do not have time to wait for those indirect goals.

The Digit Fund accomplishes active conservation by supervising foot patrols into the mountainous rain forest to destroy illegal traps, to free animals found in traps, to confiscate poacher's weapons, and to capture poachers. Depending upon the funds available, between 3 to 6 men set out from the Karisoke Research Centre, located 10,000' within the Parc des Volcans of Rwanda, to spend entire days from dawn to dusk within the mountains in search of traps and poachers. The mens' wages are set on a per diem basis regardless of the number of traps destroyed or the poacher weapons confiscated, and the mens' clothing, boots and equipment are retained at the Centre when they are off duty. Since Digit's death and the founding of the Digit Fund, 2,000 traps a year have been destroyed--the wire or hemp nooses are brought to camp to be counted and burned--and countless animals have been freed from traps. Of equal importance is that each man working on an anti-poacher patrol conducted under the jurisdiction of the Karisoke Research Centre has been personally motivated by their accomplishments toward protection of the wildlife remaining within the Virunga Mountains, the last stronghold of the Mountain Gorilla.

The essential needs of each anti-poacher patrol worker are:

- 1) \$80.00 Sturdy waterproof boots
- 2) \$50.00 Sturdy waterproof pants and jacket
- 3) \$10.00 Durable knapsack and tarp when bivouacking is necessary
- 4) \$10.00 One full day's salary
- 5) \$5.00 Blanket for overnight use at Karisoke
- 6) \$5.00 Daily food expenses including porter wages to bring potatoes, beans, corn, bread, tea, sugar, powdered milk to Karisoke.

Any contribution you can afford toward the above expenses will be greatly appreciated. Please keep in mind that it takes only one bullet, one arrow, or one trap to kill a gorilla. Please make it possible for The Digit Fund's anti-poacher patrols to continue. Semi-annual reports will be sent to all contributors.

THE DIGIT FUND
Dian Fossey, Director
Karisoke Research Centre
c/o Rane Randolph, C.P.A.
P.O. Box 25
Ithaca, New York 14851



A.A.Z.K.

NATIONAL CONFERENCE

OCT. 2-6 1983

UNIVERSITY CITY HOLIDAY INN

PHILADELPHIA PENNSYLVANIA



PHILADELPHIA ZOO

AMERICA'S FIRST ZOO

Please fill in, cut out, and return this form with your fee to: Gene Pfeffer, Conference Registration, Philadelphia Zoo Chapter AAZK, 34th and Girard Ave., Philadelphia, PA 19104.

NAME: _____ AAZK MEMBERSHIP STATUS & FEE: _____

ADDRESS: _____ Member or Spouse.....\$50.00

CITY: _____ STATE/PROV. _____ Non-Member.....\$60.00

ZIP/POSTAL CODE _____ Late Registration Fee...\$10.00
(After 15 August, 1983)

PHONE NUMBER: () _____

ZOO: _____ TOTAL FEES ENCLOSED.....\$ _____

AREA OF INTEREST _____

WILL YOU BE SUBMITTING A PAPER? ____ YES ____ NO
(\$15.00 will be refunded from registration fee upon acceptance of paper)

NUMBER ATTENDING FINAL BANQUET (Thursday evening, 6 Oct., 1983) _____

VEGETARIAN? YES NO. If YES, Special Instructions

TRANSPORTATION (car, plane, etc.)

HOTEL RESERVATION REQUEST

University City Holiday Inn, 36th & Chestnut Streets
Philadelphia, PA 19104

ORGANIZATION:

DATE OF CONFERENCE:

PLEASE CHECK BELOW THE TYPE OF ROOM YOU WISH TO RESERVE:

_____ SINGLE \$50.00 DAILY
(one person)

Room Tax - 6%

_____TWIN/DOUBLE \$56.00 DAILY
(two persons)

\$6.00 charge extra, each person over
two in a room

ARRIVAL DATE	TIME	DEPARTURE DATE
--------------	------	----------------

NAME _____

ADDRESS _____

CITY STATE ZIP CODE

TOTAL NUMBER OF NIGHTS IN HOTEL:

IF YOU WISH TO BE MATCHED WITH A ZOOKEEPER ROOMMATE, YOU MUST GIVE THAT PERSON'S FULL NAME:

PLEASE SEND ONE NIGHT'S DEPOSIT WITH THIS FORM TO: THE UNIVERSITY CITY HOLIDAY INN, 36TH & CHESTNUT STS., PHILADELPHIA, PA 19104. MAKE CHECK PAYABLE TO "THE UNIVERSITY CITY HOLIDAY INN". *The University City Holiday Inn has agreed to hold a block of rooms for attendees of this meeting until 2 September 1983. Reservations received after this date will be based on availability. Cancellation numbers will be provided for all reservations cancelled 48 hours in advance of arrival and deposit returned.

SAVE ON AIR COSTS



Lower than Excursion or Super-Saver fares!

As the official convention travel coordinator, **Aircorp** has established special convention airfares, on regularly-scheduled airlines, which are *lower than supersaver and lower than group rates.*

These airfares are not available to the general public and will be offered only to those participants booking reservations through Aircorp.

Call the airlines, call your Travel Agent,

then call **Aircorp**!

800-526-0110 and in N.J. Call 201-488-9330!

Discounted air service to the AAZK 1983 Philadelphia Conference is available from the following cities:

Albuquerque
Amarillo
Atlanta
Austin
Baltimore
Baton Rouge
Beaumont
Billings
Boston
Brownsville
Burbank
Casper

Cincinnati
Colorado Springs
Corpus Christi
Dallas
Denver
Detroit
El Paso
Grand Junction
Grand Rapids
Green Bay
Houston
Kalamazoo-
Battle Creek
Kansas City

McAllen
Memphis
Midland-Odessa
Milwaukee
Minneapolis-
St Paul
Nashville
Ontario, CA
Phoenix
Portland
Rapid City
Reno
Salt Lake City
San Antonio

San Diego
San Francisco
San Jose
Seattle-Tacoma
Shreveport
Lafayette
Laredo
Lansing
Las Vegas
Los Angeles
Lubbock
Tucson
Washington, D.C.

AAZK Accessories Available

Pins And Charms: Enameled three-quarter inch pins and charms with the official AAZK logo are now available. They are done in the same colors as the AAZK Patch and the charms are suitable for necklaces (you provide the chain). The price per pin or charm is \$3.50 which includes postage. To order send your name, complete mailing address, number of pins or charms desired to: AAZK National, 635 Gage Blvd., Topeka, Ks 66606. Make check or money order payable to AAZK National.

Buttons: For a "Keepers Care" Button, send the coupon and 50¢ to: Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614.



Decals: The official AAZK decal is available through the Memphis Zoo Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.50 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Ave., Memphis, TN 38107.

AAZK T-shirts with the official emblem are now available from the Phoenix Chapter. The price is \$6.75 including postage and handling. Sizes Small, Medium, Large, and Extra-Large are available in two colors: Tan with dark brown logo and Dark Brown with white logo. To order, complete coupon below or copy information and send with check or money order to: Mike Carpenter, 906 N. Hayden, #3, Scottsdale, AZ 85257. Make checks payable to "Phoenix AAZK Chapter". Shirts will be returned by 1st Class mail.

AAZK T-Shirt Order Form

Please send _____ T-shirts at \$6.75 each. COLOR: TAN _____ BROWN _____

SIZE: _____ Small _____ Medium _____ Large _____ Extra-Large

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

Announcing...

New AAZK Publication Available



AAZK is pleased to be able to offer its members and other interested individuals in the zoo community the newly published mammal reference booklet entitled BIOLOGICAL VALUES FOR SELECTED MAMMALS. This 55-page work contains biological data on 200 species of mammals. Included in the data are: common name, scientific name, range, gestation, weaning, lifespan, sexual maturity, litter size, estrus cycle, body temperature, and names used for the male, female and young of each species. References for data given are also included.

This informative publication was researched and compiled by a team of zookeepers, docents, interns and zoo volunteers at the San Francisco Zoo. Formated for quick and easy reference, and charmingly illustrated, this booklet will surely be an important addition to any zoo keeper's library. AAZK has arranged for 50% of the profits, after initial costs are met, to be assigned to the San Francisco Zoological Society, a non-profit support organization of the San Francisco Zoo.

BIOLOGICAL VALUES FOR SELECTED MAMMALS is being offered to AAZK Professional members for only \$1.25. Other membership categories and non-members may purchase the booklet for \$2.50. Prices include postage and handling. To order, fill out the form below or send necessary information to: Biological Values Book, c/o AKF Editorial Offices, 635 Gage Blvd., Topeka, KS 66606. Make check or money order payable to: "Biological Values/AKF".

BIOLOGICAL VALUES ORDER FORM

Please send _____ copies at \$ _____ each to:

Name _____

Address _____ City _____

State _____ Zip _____

Please check membership category: P() AF() AS() INST() NON-MEM()

OPPORTUNITY KNOCKS

(Editor's Note: The AAZPA "Positions Available" listings were not received at the AKF editorial offices in time for inclusion in this month's issue. We are sorry for any inconvenience this may cause. Individual Zoos wishing to advertise job openings are asked to send pertinent information on the position directly to the AKF offices at 635 Gage Blvd., Topeka, KS 66606 by the 15th of each month. That way, should we not be sent the AAZPA listing before our deadline, your listing may still be included. The following employment opportunity was received at our office this month.)

EDUCATION NATURALIST...assists in design and implementation of education and public information programs. Responsible for education department animals. B.S. in education or science related field and one year of zoo teaching experience (or equivalent) required. Send resume to Cindy Denney, Education Supervisor, Caldwell Zoo, P.O. Box 428, Tyler, TX 75710, (214) 593-0121.

Z O O B R I E F S

BABY PANDA BORN IN MEXICO CITY -- Mexico City's third baby panda was born on 23 June, only 97 days after breeding and about a month short of the average time span between breeding and birth. Mother and baby seem to be doing fine; zoo administrator Maria Elena Hoyo reported that "it's been moving around a lot, and judging by the amount of crying, it must have a healthy set of lungs." The Zoo credits its success in panda breeding to the Zoo's high altitude, which matches that of the panda's native Chinese habitat, and to a special diet that sounds like a combination of gazpacho and milkshakes. The baby has not been sexed.

METRO TORONTO ZOO INVOLVED IN BALD EAGLE REHAB PROGRAM -- Dr. Graham Crawshaw, Associate Veterinarian at Metro Toronto Zoo recently received two young Bald Eagles to care for in the zoo's Health Unit. About three months of age, they arrived on 4 August via the Ontario Ministry of Natural Resources. It seems that around 22 July, gusty northern Ontario winds blew over their nest and the eaglets were found on the ground at Lake Vermillion by a campground owner who tended to the eagles himself with the aid of a local doctor in Dryden before bringing them to the Natural Resources office.

Rob Barbaro, Chairman of the Zoo Board said "one of the birds is completely healthy and it will be turned over to Natural Resources officials to be released to the wild at Point Pelee. The other bird, unfortunately, was not so lucky in the fall and has a broken wing. It will be staying at the zoo as part of the Bird Demonstration. Right now it just needs time to heal and won't be on exhibit for awhile."

Metro Toronto Zoo, in cooperation with the Ontario Ministry of Natural Resources, often takes birds who are injured and after a period of rehabilitation, if they are able to look after themselves in the wild, are set free. However, if there is any doubt, they are kept at the zoo. Many of the birds in the bird demonstration program have come to the zoo as part of this cooperative rehab program.



AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo	Work Area	Special Interests
-----	-----------	-------------------

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**



Postage Paid At Topeka

NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

Animal Keepers' Forum

Shelton's Bookstore & Library



Dedicated to Professional Animal Care

OCTOBER 1983

Executive Editor: Mike Coker
Managing Editor: Susan Chan
Associate Editor: Alice Miser
Editorial Assistant: Diana Brey

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to address printed below.

AMERICAN ASSOCIATION OF ZOO KEEPERS
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614 *President*
Mike Maybry, Memphis Zoo & Aquarium, Memphis, TN 38112
Kevin Conway, NZP/Conservation & Research Center, Front Royal, VA 22630
Steve Taylor, Louisville Zoo, Louisville, KY 40213
Connie Cloak, Topeka Zoological Park, Topeka, KS 66606

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u>	<u>Coordinator for International Affairs</u>
<u>Patti Kuntzmann, Philadelphia Zoo</u>	<u>Randy Adolph, St. Louis Zoo</u>
<u>Continuing Keeper Education</u>	<u>Research/Grants Committee</u>
<u>Judie Steenberg, Woodland Park</u>	<u>Frank Kohn, Turtle Back Zoo</u>
<u>Historical Committee</u>	<u>Awards Committee</u>
<u>Larry Sammarco, Lincoln Park</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Professional Standards Committee</u>	<u>Legislative Action Committee</u>
<u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Kevin Conway, NZP/CRC, Front Royal</u>

PROJECT HEADS

<u>Film Project</u>	<u>Library Resources/Book Review</u>
<u>Karen Starr Wakeland</u>	<u>Ellen Leach, Woodland Park Zoo</u>
<u>Staff Exchange</u>	<u>Program Library</u>
<u>Elandra Aum, Woodland Park Zoo</u>	<u>Mike Crocker, Dickerson Park Zoo</u>
<u>Animal Data Transfer Forms</u>	<u>Biological Values Booklet</u>
<u>Bernie Feldman, Topeka Zoo</u>	<u>Mary Mure, San Francisco Zoo</u>
<u>Keeper Accommodations List</u>	<u>Infant Development Project</u>
<u>Oliver Claffey, Metro Toronto</u>	<u>Steve Taylor, Louisville Zoo</u>
<u>Diet Notebook</u>	<u>Membership Directory</u>
<u>South Florida Chapter, Miami</u>	<u>Pat Sammarco, Lincoln Park</u>
<u>Keeper Data Survey</u>	
<u>Mary Slaybaugh, San Antonio Zoo</u>	<u>Dave Orndorff, Sea World Shark Institute</u>

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, *Director*

Linda Rohr	W.D. Stone Memorial Zoo	ME, VT, NH, MA, RI, CT
Vacancy		NY
Gene Pfeiffer	Philadelphia Zoo	PA, NJ, MD, DE
Angela Keppel	National Zoo	VA, W. VA, D.C.
Randy McGill	Detroit Zoo	MI
Lynne Villers	Indianapolis Zoo	IN, OH, KT
Larry Sammarco	Lincoln Park Zoo	WI, IL, MO, MN, IA
Vacancy		TN, NC, SC
Alan Sharples	Atlanta Zoo	FL, AL, GA
Vacancy		AR, MS, LA
Candy Kroft	Rio Grande Zoo	TX, NM, CO, OK, KS, NE, SD, ND
Lawrence Gledhill	Woodland Park Zoo	WA, OR, ID, MT, WY, AK
Joan Stinson	Phoenix Zoo	CA, NV, AZ, VT, HI
Vacancy		Canada

This month's artist is Rebecca Conway. Her drawing features her husband, Kevin, a Keeper at the NZP Conservation & Research Center at Front Royal, VA and an infant lesser panda. Thanks, Rebecca!

Scoops and Scuttlebutt

RIVERBANKS CHAPTER TO HOST FIRST AAZK REGIONAL

The Riverbanks AAZK Chapter will be hosting the Southeastern Regional AAZK Conference at Riverbanks Zoological Park on April 19, 20, & 21, 1984.

Papers are requested for this conference. Each paper will be limited to 20 minutes with a five minute question/answer period. Topics should pertain to zoos and zookeeping. Abstracts or outlines should be submitted by February 15, 1984. The conference registration fee will be reduced for those presenting papers.

The conference registration fee is \$25.00 per member and \$30.00 per non-member. Day rates for conference activities will be available. Conference activities will include: presentations of papers, several keynote speakers from various zoos and institutions, tours of Riverbanks Zoological Park and will conclude with a Chicken Bar-B-Que. All conference events will be held on the Riverbanks Zoological Park grounds.

Look for Regional Conference registration forms and more information in the next issue of Animal Keepers' Forum. Send papers to and request information from: Stephen J. Danko, Regional Conference Coordinator, Riverbanks AAZK Chapter, Riverbanks Zoological Park, 500 Wildlife Parkway, Columbia, SC 29210. Hope to see you in April!

NEC ANNOUNCES NEW AAZK BOARD MEMBERS

National Elections Committee Chairman Lynne M. Villers, Indianapolis Zoo, has announced the following election results for the American Association of Zoo Keepers Board of Directors: elected to the Board were Mike Carpenter, Phoenix Zoo; Jean Hromadka, Miami Metrozoo; and Verona Barr, Miller Park Zoo. They will serve on the Board beginning Jan. 1, 1984 and their terms of office will expire December 31, 1987. Kevin Conway, NZP Conservation and Propagation Center, and Patricia Sammarco, Lincoln Park, continue on the Board until December 31, 1985.

THREE NAMED TO EDUCATION COMMITTEE

The following individuals have been appointed to the AAZK Education Committee: John Jaffe, Potawatomi Park Zoo; Beth Poff, Mill Mountain Zoo and Rick Gutman, St. Louis Zoo. Judie Steenberg, Woodland Park Zoo, is Chairman of the AAZK Education Committee.



1983 AMERICAN ASSOCIATION OF ZOO KEEPERS AWARDS

The following awards were presented at the AAZK National Conference held in Philadelphia, PA on October 2-6, 1983. The Excellence in Zoo Keeping Awards and Meritorious Achievement Awards are selected by the AAZK Awards Committee. There was no Certificate of Merit for Zoo Keeper Education Award given this year. The Excellence in Journalism Awards are selected by the Animal Keepers' Forum editorial staff.

1983 EXCELLENCE IN ZOO KEEPING AWARD WINNERS

Judie Steenberg, Woodland Park Zoological Gardens, Seattle, WA

Bob Wolf, Los Angeles Zoo, Los Angeles, CA

AAZK MERITORIOUS ACHIEVEMENT AWARD

In recognition of outstanding contribution in the field of wildlife conservation and animal husbandry

Allen Foust, Turtle Back Zoo, West Orange, NJ

Steve Taylor, Louisville Zoological Garden, Louisville, KY

Brookfield Zoo AAZK Chapter, Brookfield, IL

Louisville Zoo AAZK Chapter, Louisville, KY

AAZK DISTINGUISHED SERVICE AWARD

Ed Roberts, W.D. Stone Memorial Zoo, Stoneham, MA

1983 AKF JOURNALISM AWARD WINNERS

Outstanding Mammal Article: "Dominance and Social Dynamics of a Group of Captive Capybaras"

Frank B. Kohn, Audubon Park & Zoological Gardens, New Orleans, LA

Outstanding Herpetology Article: "Maintenance of the Eastern Coral Snake on an Artificial Diet"

Fred Antonio, Santa Fe Community College Teaching Zoo, Gainesville, FL

Outstanding Avian Article: "Breeding the Black and White Casqued Hornbill at Metro Toronto Zoo"

Duncan Bourne & Douglas Chessell, Metro Toronto Zoo, Toronto, Canada

1983 AAZK/AKF AWARDS, Continued

Outstanding Narrative Article: "Policy Is The Best Policy"

Jeanne Grossmayer, Akron Zoological Park, Akron, OH

Outstanding Exhibit Design Article: "The Use of Clear Strip Curtains
As Weather Barriers for Zoo Animals"

Robert R. Peel & B.D. Klassen, Calgary Zoo, Calgary, Canada

Outstanding Cover Art Award: March 1983 Issue of Animal Keepers' Forum

*Pamela Sardinias Campa
Santa Fe Community College Teaching Zoo
Gainesville, FL*

HONORABLE MENTION AWARDS

Mammal Articles

"Birth and Rearing of Elephas Maximus" by Jean Hromadka, Miami Metrozoo

"Hare Raising Experience" by Kevin Moore, Salmonier Nature Park

Herpetology Articles

"Captive Reproduction of the Sheltopusik" by Oliver Claffey & Bob Johnson
Metro Toronto Zoo

"A Simple, Effective Method of Removing Leeches of Captive Turtles" by
Hank Guarisco, Animal Care Unit
University of Kansas

Avian Articles

"Waterfowl Breeding Program in the Birmingham Zoo" by Donna Mason Smith

"Hand-Raising Blackfoot Penguins at the Riverbanks Zoo" by Forrest Penny

Narrative Articles

"Hillkeeper Peepers or Urine-For-Life: A Fine Art" by Lynette Shirley
Dallas Zoo

"A Second Look at Africa" by Mary L. Swanson, Fresno Zoo

Exhibit Design Articles

"Renovation of a 50-Year-Old Big Cat Exhibit" by Mary L. Swanson, Fresno

"Woodland Park Zoological Garden's Gorilla Exhibit" by B. Wayne Buchanan



Births & Hatchings

TAMPA BUSCH GARDENS.....Andrea Hart

B&H for the month of August include: Mammals - 2.0 Impala, 2.0 Grant's gazelle, 0.0.1 Black spider monkey, 2.2. Defassa waterbuck, 0.1 Kafue (Red) lechwe, 1.1 Grant's zebra, 1.0 Blesbok, 0.1 Blue gnu, 0.0.2 Common marmoset, 1.0 Nyala, 3.1 Thomson's gazelle, 1.0 Greater kudu, 0.1 Muntjac, 0.1 Dromedary camel; Birds - 7 Scarlet ibis, 1 Lesser sulphur-crested cockatoo, 2 Mexican military macaw, 2 Jandaya conure, 4 Ringed teal, 1 Sun conure, 1 Cockatiel, 1 Eytan's tree duck, 10 Indian peafowl (Blue Phase) and 2 Black-necked stilt.

MILWAUKEE COUNTY ZOO.....Steven M. Wing

August 1983 B&H include: Mammals - 0.0.1 Bennett's wallaby (DNS), 1.0.3 Indian fruit bat (1.0.1 DNS), 0.1 South American tapir, 0.1 Greater kudu, 1.0 Pygmy goat; Birds - 0.0.1 Laughing gull, 0.0.1 Diamond dove, 0.0.2 Parrot-billed seedeater; Reptiles - 0.0.12 Blood python.

WOODLAND PARK ZOOLOGICAL GARDENS.....Mary Bennett

B&H for July 1983 include: Mammals - 0.0.1 Two-toed sloth, 0.0.1 Satyr tragopan, 2.1 Lion (1.0 DNS), 1.0 Springhaas, 0.1 Brazilian tapir; Birds - 0.0.2 Red-crested touraco, 0.0.5 Radjah shelduck, 0.0.7 Monk parakeet, 0.0.2 Hartlaub's touraco, 0.0.1 Common pintail, 0.0.2 Common gallinule, 0.0.7 Common rhea, 0.0.2 Black-necked stilt, 0.0.7 North American black duck, 0.0.6 White-faced whistling duck, 0.0.2 Half-masked weaverbird (1 DNS), 0.0.1 Nicobar pigeon (DNS); Herps - 0.0.3 Leopard gecko (1 DNS) and 0.0.1 Green & black arrow poison frog.

BLACK HILLS REPTILE GARDEN.....Bill Texel

July and August B&H include: 0.0.1 Brazilian crested cardinal, 0.0.8 Yellow rat snake, 0.0.11 Eastern massasauga, 0.0.10 Haitian curly-tailed lizard and 0.0.15 Western plains garter snake.

MINNESOTA ZOOLOGICAL GARDEN.....Brint Spencer

July 1983 B&H include: Mammals - 0.0.2 Sugar glider, 0.0.7 Domestic rabbit, 0.0.1 Chinchilla, 1.1 Mongolian wild horse and 0.1 Larger Malay chevrotain; Birds - 0.0.1 Garganey teal, 0.0.1 Common white eye duck, 0.0.1 Red-crested pochard, 0.0.1 Red spurfowl, 0.0.2 Grey peacock pheasant, 0.0.1 Pied imperial pigeon, 0.0.4 Eastern bluebird, 0.0.2 White-crested laughing thrush, 0.0.1 Golden-crested mynah and 0.0.1 Red-eyed starling.

DALLAS ZOO.....Tami Jones

B&H for the month of August 1983 include: Mammals - 1.0 Plains bison, 1.0 Reticulated giraffe, 0.1 Sicilian donkey, 1.0 Suni, 0.1 Axis deer, 0.1 Greater kudu, 1.0 Barbados sheep; Birds - 1 Black-necked stilt, 3 Red-vented bulbul, 14 Fulvous whistling duck, 1 White-cheeked touraco, 6 Radjah shelduck, 2 White-headed pipping guan, 2 Roseate spoonbill, 3 Gouldian finch; Reptiles - 2 Wood turtles, 10 Children's python, 4.1 Honduran kingsnake, 1.0 Jalisco kingsnake.

BIRTHS AND HATCHINGS, Continued

BROOKFIELD ZOO.....John S. Stoddard

August 1983 B&H include: 0.0.7 Arrow poison frog, 0.0.1 Turquoise tanager, 0.0.3 Callimico, 0.0.1 Squirrel monkey, 4.1 Collared peccary and 0.1 European wisent.

MEMPHIS ZOO.....Robert L. Evans

B&H for the Memphis Zoo for August 1983 are: 0.1 Nilgiri tahr, 1.0 Giraffe, 1.1 Greater kudu, 8.6 White-lipped python, 0.0.11 Ringed teal, 0.0.6 Rosy-billed pochard, 0.0.2 Roul-roul, 0.0.2 Hartlaub's touraco and 0.0.4 Ostrich.

LINCOLN PARK.....Susan Moy

The following are the B&H for August 1983 at Lincoln Park: Mammals - 0.0.2 Cotton-top marmoset, 0.0.1 Mandrill, 0.0.2 Geoffroys tamarin, 0.0.1 Springhaas, 0.0.1 Patagonian cavy; Birds - 0.0.9 Ruddv duck (2 DNS), 0.0.1 Sun-bittern (DNS), 0.0.2 Superb starling (2 DNS); Reptiles - 0.0.1 Blanding's turtle and 0.0.2 Basilisk lizard.

ASSINIBOINE PARK ZOO.....Barb Haffner

Recent B&H at Assiniboine Park Zoo, Winnipeg, Canada are: April - 5 Chinese dhole, 1 Common marmoset, 1 Red-fronted lemur, 3 Ruffed lemur, 2 Pere David's milu deer, 2 Yak, 3 Pronghorn, 3 Addax, 1 Reindeer; May - 12 Burmese python, 1 Swinhoe's pheasant, 1 Blue grey tanager, 1 Red-vented bulbul, 2 Golden pheasant, 1 Western Canadian porcupine, 10 Alpine ibex, 2 Addax, 6 Reindeer, 1 Pere David's deer, 1 Musk ox, 1 American prairie bison, 9 Chinese waterdeer, 3 Grey fox, 3 Afghanistan markhor, 1 Woodland caribou, 1 European bison, 1 Canadian elk; June - 3 Elk, 1 Woodland caribou, 2 Formosan sika, 2 Afghanistan markhor, 1 Bactrian camel, 1 Chinese waterdeer, 1 Guanaco, 1 European bison, 2 Bald eagle, 1 California bighorn, 5 Mule deer, 1 Golden pheasant, 9 Barnacle geese, 1 Spur-winged plover, 4 Fulvous whistling duck, 2 Reeves pheasant and 2 Swinhoe's pheasant.

CALIFORNIA ALLIGATOR FARM HATCHES *Crocodylus p. palustris*

Submitted by Doug Leinberger, Head Keeper C.A.F.

Once again, The California Alligator Farm, Buena Park, CA announces another hatching of an endangered species of Crocodylian. As far as we know, this is the first successful hatching of *Crocodylus p. palustris* in the U.S. We welcome this event as we have in the past with the hatching of other endangered species of Crocodylians - *Crocodylus rhombifer*, *Crocodylus niloticus*, *Caiman c. yacare* and *Alligator mississippiensis*.

On 11 December 1982, mating of the Mugger crocodiles (*Crocodylus p. palustris*) in their pool was observed. Four months later, on 13 April 1983, five eggs were discovered at 07:30 hours. At the time the eggs were recovered, they were still covered with mucus.

All but one of the eggs hatched intact, one was cracked. The five eggs were placed in a damp peatmoss substrate and incubated at 88°F. Three months later, on 15 July 1983, two eggs hatched but only one hatchling survived. Three days later the remaining eggs were opened. Two eggs contained nearly fully-developed dead baby crocodiles.

BIRTHS AND HATCHINGS, Continued

A brief malfunction of the incubator caused a decrease in temperature of approximately 10°F. Apparently this rendered the developing crocodiles incapable of absorbing their yolk properly. This was evident as their abdomens were greatly distended.

Presently, 22 August 1983, the surviving Mugger hatchling, "Moses", is 10 3/4" or 27.5cm long. It lives in a five-gallon aquarium with the water temperature at a constant 90°F. The hatchling is fed twice a week on pink mice and chicken. Soon "Moses" will be put on public exhibit with many of the California Alligator Farm's other successful efforts of Crocodilian propagation.



Coming Events

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Grand Rapids, MI

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Sacramento, CA

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

April 15-17, 1984

Omaha, NE

AAZK SOUTHEASTERN REGIONAL CONFERENCE

April 19-21, 1984

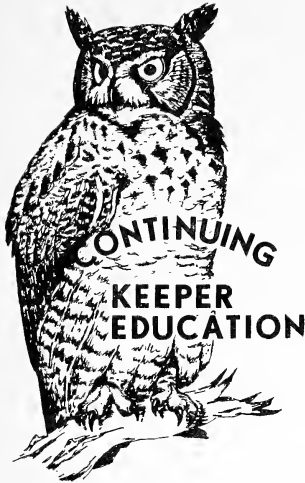
Columbia, SC

Hosted by the Riverbanks Zoo AAZK Chapter. Registration fee is \$25.00 for members and \$30.00 for nonmembers. Contact person at Riverbanks Zoo is Stephen J. Danko. Watch AKF for registration forms and information.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 29-May 1, 1984

Philadelphia, PA



STAFF EXCHANGE UPDATE

The results of a nation-wide survey conducted in July, 1982 indicated that a majority of zoos were interested in a staff exchange program. It was also learned that several institutions have already had Keepers participate in exchanges. Benefits listed as a result of Keepers spending time at other zoos were improved attitudes and greater enthusiasm for their jobs, along with increased knowledge and expertise in their field. In addition, such exchanges create higher potential for information flow and cooperation between the participating institutions.

Since staff exchanges can take many forms, they are best set up on an individual basis with each institution designing its program to match its own needs and objectives. The Puget Sound Chapter of AAZK will act solely as a catalyst to help develop a network and as a central collection site for information on the program. By the end of August, all institutions indicating an interest in participating will have received the following list of guidelines and suggestions on how to set up a staff exchange. This list was compiled from institutions and individuals who have already participated in a program of this nature. They also received a Staff Exchange Registration Form.

Upon receipt of the completed registration forms a master list of institutions interested in participating will be compiled and distributed. It will also be printed in Animal Keepers' Forum.

Suggestions for Conducting a Staff Exchange Program

- Establish a procedure for obtaining administrative approval.
- Have a staff exchange contact person, to be familiar with program details, handle inquiries, and facilitate exchanges.
- Develop criteria for selecting staff eligible to participate, for example: seniority, first come, first served; minimum tenure; waiting list.
- Establish parameters for length of exchanges. Some considerations: participant's level of expertise, goals of the exchange, and of course how long a staff member can be spared.
- Set wage policy for exchanging personnel. In the past, it has worked best for the "home" institution to continue employee's full wages and benefits while the employee is away. Lost labor-hours are partially offset by aiming for one-on-one exchanges. An institution with a very small staff may find it necessary to organize a simultaneous exchange.

Participant Responsibility in an Exchange

- Initiate and follow through in producing your own exchange.
- Communicate fully with appropriate staff at the "home" and the host institutions. There may be a designated contact person at each through whom you can work.
- Have a cogent and valid purpose for participating and stay with that purpose.
- Clearly understand and follow both institutions' exchange policies.
- Be prepared to handle travel, accomodations and personal expenses. There may be a Keeper Accomodation List in the area you wish to visit; your institution may have travel funds; you may be able to earn a grant or scholarship.
- If you run into difficulties, seek and find assistance.
- Behave as an ambassador for your institution and for the program in general.
- Fulfill requirements for reports, presentations, etc. at your home institution.

If you find that your zoo has not received the above guidelines and the registration form and is interested in participating, contact Elandra Aum, AAZK Coordinator, Staff Exchange Project, Woodland Park Zoological Gardens, 5500 Phinney Ave. N., Seattle, WA 98103.

DEADLINE FOR CHINA EXCHANGE NEARS

The deadline for applications to participate in the exchange tour of China is rapidly approaching. Get your space reserved now! Since there has been a slight mixup on when applications, resumes, outlines, and deposits must be received, I am authorized to continue to accept these until the last week of November, and to send everything in to China-U.S. Scientific Exchanges, Inc. on December 1. THE ABOVE ITEMS NEED TO BE IN THE MAIL BY NOVEMBER 23. RESUMES AND OUTLINES SHOULD BE NEATLY TYPED.

Thank you for your consideration.

Elandra Aum
Staff Exchange Team



GIRAFFA CAMELOPARDALIS

By

Ted Daehnke, Animal Keeper
Sacramento Zoo, Sacramento, CA



On the morning of 4 January, 1983, a male giraffe was born at the Sacramento Zoo. By the time we found the youngster his mother was showing no interest in him and he appeared dead. He had a temperature of 94°F, well below the 101°F expected. We placed the baby in a hot water bath until his temperature reached 103°F. We then removed him from the water, dried him off and tube fed him a quart of cows' colostrum. When his temperature had dropped to 101.2°F he was rubbed with the after birth and returned to his mother. Our biggest worry was that she might not accept and nurse the baby after separation.

At 1700 hours the baby was standing on his own, but had not nursed and had a temperature of 99.9°F. We directed a heater into the stall and keeper Jane Hansjergen elected to remain with the baby giraffe throughout the first night. The youngster made several attempts to nurse the first night, but each time his mother either kicked or moved away. Jane bottle fed the baby at 2140 and 2220 hours for a total of about 3 ounces, and by 2315 hours his temperature had dropped to 98.3°F. Dr. Murray Fowler, our veterinarian, was consulted and he advised that if the baby's temperature dropped below 96°F he should be moved into a warm room.

By 0400 hours his temperature had risen to 98.9°F. The mother was very restless and spent much of the night pacing. She would lick the baby and push him toward her teats, but once he showed an interest she moved off. Her teats were very full by this time and any contact may have been painful. At 0515 hours the baby walked between his mother's front legs and back to the teats. She remained motionless for about 4 minutes. The baby was directly below his mother's teats, but would not raise his head and she finally lost patience and moved off. The baby received 4 to 6 ounces of cow colostrum at 0650 hours. The colostrum was forced into his mouth with a plastic bottle and then his neck was stroked to stimulate swallowing. He displayed no sucking reflex.

The mother was put out of the barn at 1145 hours and the baby was tube fed a quart of cow's milk, at this point his temperature was 97.4°F. We decided to try bottle feeding the baby at 0900, 1600 and 2100 hours and tube fed at noon, if necessary. We fed 1/3 to 1/2 of what the baby could take to insure that he stayed hungry and attempted to nurse from his mother. When he was fed at 2040 hours of the second day, his sucking response was much improved and his temperature was 100.2°F. A heated area was prepared in the corner of the stall for the baby's second night, but at 0830 hours the next morning he was found by the outside door away from the heated area and his temperature was 95°F. We moved him back to the heated area, covered him with blankets and fed him 32 ounces of cow's milk. By 1215 hours his temperature had risen to 97.2°F. At this point we decided to bottle feed 16 ounces 4 times a day and move the baby to a heated room at night. At 1543 hours of the third day the baby was observed nursing for the first time. We continued bottle feeding. The baby nursed a number of times throughout the fourth day. By noon of the fifth day, the baby would not accept the bottle and seemed to be nursing fine, so the bottle feedings were discontinued. We also used straw bales to build an enclosure within the stall near the heat source and placed the baby in this at night instead of removing him from the stall completely.

GIRAFFA CAMELOPARDALIS, Continued

At 2100 hours of the fifth day, the baby defecated for the first time since his hot bath. The stool was semi-solid, orange in color and amounted to about 4 cups. On the sixth day part of the straw barrier was removed and the baby was given free access to his mother day and night.

When the baby was first taken to isolation for his hot bath, he also received 500ml lactated Ringers (IV), 1.0ml vitamin E and selenium (IM). On the second morning he received 2cc B-Sol (IM) and 3.25cc TRIBRSSEN (IM). The TRIBRSSEN was continued twice daily until the evening of the fifth day at which time the antibiotics were discontinued. He received 1.5cc of vitamin E and selenium (IM) at noon on the fifth day. The baby giraffe did not nurse from his mother until the third day and received supplemental feedings through the first five days.

The first day he was tube fed 1 quart of cow's colostrum and bottle fed about 3 ounces of cow's milk. On the second day he was bottle fed another 4 to 6 ounces of cow's colostrum and tube fed 1 quart of cow's milk. The second evening he was bottle fed 12 ounces of cow's milk. The third day he was bottle fed 32 ounces of 1/1 mixture of whole cow's milk and enriched cow's milk at 0830 hours; 16 ounces at noon, 1700 and 2130 hours. He received 4-16 ounce bottle feedings of this same mixture on the fourth day and one last feeding of 20 ounces on the morning of the fifth day.

Most of our problems with the infant can probably be blamed on the weather. Sacramento's mild climate allows us to keep tropical animals in unheated barns. If the adults have protection from wind and rain they have little trouble maintaining their body temperature. Unfortunately, the babies are not as hardy. In the past our giraffes have been born in May and the weather was not a problem, however, this baby not only arrived in January, but also arrived a month earlier than we had expected. When we found the baby he was lying in a draft near the outside doors. In the future, we will keep a closer eye on pregnant females in the winter, and when birth is imminent, take steps to make the barn as comfortable as possible.



WHAT'S COOKING AT THE ZOO?

Have you ever wondered how much food is consumed at the zoo in one month? The following is an abridgement of the animals' monthly grocery list:

- ¶¶ 5,936 lbs. of fresh fruit, plus 22 cans of applesauce, 6 cases of diet fruit cocktail, and 3 cases of peach nectar.
- ¶¶ 7,590 lbs. of fresh vegetables, plus 368 mats of hydroponic grass.
- ¶¶ 5,527 lbs. of frozen fish, plus 1,800 live goldfish.
- ¶¶ 5,495 lbs. of frozen feline and canine diets, 86 cases of marmoset diet, and 1,091 bags of assorted chows.
- ¶¶ 2,948 whole chicks, mice, and rats, plus 7,211 lbs. of horsemeat and other frozen or canned meat.
- ¶¶ 92,000 crickets, 125 lbs. of mealworms, and 5 boxes of nightcrawlers.

---from TIGERTALK, August 1983
National Zoological Park
Washington, D.C.



One call does it all!

NEBRASKA BRAND



Quality Assured Diets
That Have
Constant Formulation
For
Balanced Nutrition
And
Economical Feeding

Frozen Feline Diets
(Horsemeat or Beef)

Frozen Bird of Prey Diets
(Fine or Coarse Grind)

Frozen Canine Diet

Chunk and Chopped Horsemeat,
Hearts, Livers, Rib, Shank and
Knuckle Bones



SPECTRUM

Banana Flavored Primate
(15% Protein)

Banana Flavored Primate
Pro-Plus
(25% Protein)

Omnivore Dry

Polar Bear Dry

Canine Dry

Ratite Dry

Hoofstock Supplement
(with Selenium)

TOLL FREE

(800)

228-4005

In Nebraska, call collect
(402) 488-6492

Zu/Preem[®]

Feline Canned

Ratite Dry

Primate Canned

Omnivore Dry

Marmoset Canned

Primate Dry

Animal SPECTRUM Inc.

5801 Locust Street

Lincoln, Nebraska 68516

THINK Safety!



THINK SAFETY - EXPECT THE UNEXPECTED!

Education Alternatives...

TRAINING EXPERIENCES AT THE

JERSEY WILDLIFE PRESERVATION TRUST



By
Robert Berghaier
Senior Keeper, Philadelphia Zoo
Philadelphia, PA

The last nine weeks of 1982, I had the opportunity to take part in a training program at the Jersey Wildlife Preservation Trust, Isle of Jersey, British Isles. Founded by noted author and conservationist Gerald Durrell, the Trust was established in 1959 to provide a captive breeding center for endangered species of wildlife. Since its conception, the Trust has had the most successful breeding record of any zoological organization. To complement this excellent propagation program, the Trust has established a training regime to instruct personnel from other institutions with similar goals.

The island of Jersey is located fifteen miles off the West Coast of Normandy. In spite of its proximity to France, Jersey, as well as the rest of the Channel Islands, has remained British Territory. The history of the islands is a fascinating microcosm of England's conflicts on the European continent with several threats or actual invasions by the French. The last successful conquest of Jersey took place as recently as 1940, making the Channel Islands the only British Territory to fall to the Germans in World War II. The Germans remained until the fall of the Third Reich in 1945. If one wonders why the Allies did not attempt to reconquer the Islands sooner, one need only visit Jersey's coast. Dozens of bunkers, pillboxes and fortified positions still in place show just how costly in lives a recapture effort would have been. The islands suffered under the German occupation. It is still a touchy subject on Jersey when questions are raised about whose family did or did not cooperate with the occupiers.

In spite of its turbulent past, the approximately 50 square mile island is a picturesque locality. Attractively landscaped estates and farms with hedgerow boundaries cover most of Jersey. Agriculture forms the chief industry of the isle. That famous breed, the Jersey cow, originated here. Not only farming, but tourism is a major business. While Jersey's North Coast is rugged and photogenic, the South, East and West of the Island have strikingly scenic sandy beaches which provide excellent swimming and snorkeling. The Channel Islands and the nearby French Coast are the sight of some of the most extreme tidal changes in the world. At low tide one can walk out miles from the shore, but also keeping in the back of one's mind that at high tide the return path may be submerged.

Another tourist attraction on Jersey is the 35 acres of the Jersey Wildlife Preservation Trust (WPT). The grounds are centered around an 18th century manor house. The original barns and other structures form the foundation for many of the animal exhibits. The property is beautifully landscaped and, in season, the floral displays are spectacular. The animal collection is centered around a core list of species which are given top priority for breeding projects. The mammals number 15 species. Included are both the Sumatran and Bornean orangutans, lowland gorillas, spectacled bears, Rodrigues fruit bats, snow leopards, Jamaican hutias, three species of lemurs, three types of endangered tamarins. Birds are represented by touracos, rare pheasants, flamingos, endangered species of waterfowl, the nearly extinct

TRAINING EXPERIENCES AT JERSEY WILDLIFE PRESERVATION TRUST, Continued

Mauritius pink pigeon, Rodrigues fody, St. Lucia and St. Vincent parrots. The reptile breeding program specializes in Caribbean boas, the rare Madagascar radiated tortoise and three species of the highly endangered Round Island herpetile fauna.

The Trust's relationship with Round Island will be given as an example of how WPT helps endangered wildlife. Round Island is a small island off the coast of Mauritius in the Indian Ocean. Only 350 acres, Round Island is the home of seven species of reptiles found nowhere else in the world. The island can best be described as a miniature Galapagos Island, and like the Galapagos, an evolutionary treasure house. The Trust sponsored the expedition that first documented the dangers to Round Island's fauna from feral goats and rabbits. They financed the eradication program to remove these feral pests and convinced the Mauritius government to establish Round Island as a nature reserve. They also trained native Mauritians in captive propagation methods and finally captured representatives of three species of reptiles for a captive breeding program. Since the goats and rabbits had devastated the island's vegetation and, thereby, caused soil erosion, the reptiles existence was and still is in jeopardy. The Trust's successful captive breeding program for these reptiles acts as a reservoir to draw upon to restock the island when the environment stabilizes. Other Trust projects have taken place in Assam, India (pygmy hogs), Jamaica (hutias & boas), Rodrigues Island (fruit bat & fody's), and others in various areas of the globe. This level of commitment makes the Trust one of the few zoos which complement their captive breeding projects with active field research; an element which is a necessity for successful reintroduction.

The idea for a training program came about when it was decided that the Trust's goals could best be fulfilled by giving nationals of the countries of reintroduction sites specialized teaching to allow them to take over projects in their homelands. This scheme was eventually expanded to encompass other qualified individuals who had positions with other institutions which conduct programs for captive propagation of wildlife. The project has to date trained a total of nearly 70 individuals from such diverse places as India, Hong Kong, Australia, Jamaica and, of course, the United States.

I arrived on Jersey on the rainy night of October 24th. The wet introduction was somewhat prophetic, since it rained or hailed most of the time I was there. I certainly had not picked this time of the year for the weather. I immediately settled in at the Trust dormitory at Les Noyes Manor. Each student at the facility had their own room and shared kitchen and bathroom facilities. Our housekeeper, Pat Gilson, provided excellent English fare such as meat pies, kippers, oxtail soup and creamy desserts. I ended up 15 pounds heavier when I returned home. My fellow students were a diverse lot. Their origins and interests show just how much spirit of conservation has spread around the world. Ismail Kamel was a Bahrainian who worked in a wildlife park located on the Persian Gulf. Mr. Itang was the future head keeper of a new zoo to be built in Calabar, Nigeria. Lela Fischer, a Brazilian, worked in a Rio de Janeiro endangered primate facility. Nulbio Valencia would return to his native Columbia to help work on a breeding project for rare Andean fauna. Nicholas Williamson was a Danish student who wanted some practical experience with animals before he decided on his university goals. My two fellow Americans, Hank Guarisco (University of Kansas) and Ann Beveridge (Staten Island Zoo) and myself had United States zoo experience. The Trust Training Officer, David Waugh, provided advice and good humor to our stay. It was a colorful collection of individuals and we learned as much from each other as we learned about animal husbandry from the Trust.

The training regime involved working right along with the Trust staff while they went about their daily routines. This allowed you to see first hand how the Trust methods have led to their outstanding breeding success. The emphasis is on the psychological as well as physical well-being of the collection. For mammals, particularly primates, this is essential. The animals are offered a great variety of foods. Cage maintenance is kept to a minimum so as to allow necessary sanitation while not overly disturbing the occupants. This philosophy is in marked contrast to most U.S. zoos which stress simple prepared diets and accentuate cleanliness. The Trust strongly believes in its procedures and the breeding results seem to confirm their theories. Along with this practical experience, lectures were given by staff twice weekly on a diverse selection of topics dealing with conservation, the modern role of zoos and captive propagation techniques. Indispensable to the Trust's success is its dedicated, talented staff. Many of the animal care personnel have also carried out the Trust's field projects. This mixture of keeper and field biologist is a natural combination which has proven its worth.

Living in a foreign country became another educational experience. I thought that speaking the same language as my host would help me to adjust. After hearing such expressions as calling the bathroom the loo, the trunks of cars boots, and being asked in a restaurant whether I wanted my coffee black or white (with cream), I began to wonder. I learned to play five-a-side football (what we would call indoor soccer), the rules of rugby, how to order a pint of better at the pub, that cheers means thanks, and that being called a towrag is considered a great insult in Scotland. One great shock was discovering that pubs stopped serving alcohol at 10:30 and showed you to the door at 11 p.m. I now know why Andy Capp of the funnies gets so irate when he hear "time, gentlemen, please". I found the English eccentric, likeable, and often, very friendly. This, in spite of hearing several times that old WW II adage that there were three things wrong with Yanks: They are over paid, over sexed, and over here. They in turn had trouble understanding my version of the mother tongue and were bewildered by both American football and Ronald Reagan in equal portion.

I can sum up my nine-week stay as a learning encounter. I not only managed to discover techniques that I could use in my chosen profession, but I also found how much peoples from various cultures have in common. It is truly a small world we share.



Information Please

The Santa Barbara Zoo is reviewing the diet for our two teenage Asian elephants. We would appreciate any information given us in regards to diet contents, amounts fed, and number of feedings per day of elephants at various zoos. Please send all information to: Mary Dukes, Santa Barbara Zoo, 500 Ninos Drive, Santa Barbara, CA 93103.

Information is sought on white-cheeked gibbon (*Hylobates concolor*) exhibits. The National Zoo has proposed a new walkway through the park with several new exhibits, one of them being for gibbons. We would appreciate any information, pictures or suggestions on already existing displays, or ideas you might have on a new enclosure for this species. Please send any information to: Dianne Janczewski, Primate Division, National Zoological Park, Washington, D.C. 20008.

INFANT DEVELOPMENT PROJECT (IDP)

Avian Data Forms

By
Jill Grade
Aves Advisor, AAZK IDP Committee

The AAZK Infant Development Project Committee has developed forms for contributions from aviculturists on parent-reared young. Many of you will be receiving these forms through your curators or key AAZK members at individual zoos. If forms do not become available to you at your zoo, copies may be obtained from the Committee. These forms are printed on the following pages for your perusal. Comments and suggestions are welcome.

We cordially invite you to participate in this project for the benefit of all concerned. Please, take the time to share your knowledge with us by completing the avian data forms as time allows. The information compiled by this Committee will be made available to anyone, free of charge. A work-up on just one or two prototype specimens from the collection at your zoo, multiplied by a larger number of project participants, could result in a collection of invaluable insights into the rearing of many aves species.

Instructions

The purpose of this project is to collect data on parent-reared birds that would be useful in establishing a guide(s) for judging the normal range of parent-rearing activities/techniques for the same species. Such data would be useful in establishing procedures for hand-rearing young of that species.

IDP avian data forms (and articles) will be published from data worksheets by AAZK, for use in the "AAZK Infant Development Notebook", or as supplemental material for AAZPA's "Infant Diet/Care Notebook". The worksheets allow for the recording of basic information, but it is hoped that you will write in greater detail for the articles section of the notebook.

Please keep these instructions in mind when preparing your data form and worksheets:

- 1) The Guidelines provided are meant to give suggestions about what type of information may be appropriate in each category for inclusion in your worksheet. They are not meant to be strictly followed--utilize only those suggestions which apply to your study species. Guideline numbers (1...2...3...) may be used to clarify points of information. Consult ISIS for scientific names.
- 2) In some cases, incomplete worksheet forms may be acceptable. Parts I and V are somewhat expendable; II and III should be included whenever possible; IV must be included to qualify for this project. Reasons for incomplete worksheet forms may be explained in Part VI. If you are including an article to elaborate on your data, please make a notation to that effect, also in Part VI.
- 3) Please type worksheet data forms accurately and neatly, using single spacing. Submit well organized original or good clean copy, from which copies for the notebook can be made.

INFANT DEVELOPMENT PROJECT/AVIAN DATA FORMS, Continued

Send completed worksheet forms and accompanying articles to:

Steve Taylor, IDP Chairperson
Louisville Zoo
1100 Trevillian Way
Louisville, KY 40213

AAZK INFANT DEVELOPMENT PROJECT
AVIAN DATA FORMS
GUIDELINES

**Form condensed for AKF
publication*

COMMON NAME: _____

SCIENTIFIC NAME: _____

SUBMITTED BY: _____ INSTITUTION: _____

DATE: _____

I. REPRODUCTIVE HISTORY

- 1) mortality rate in previous clutches and young, probable causes

II. ENVIRONMENT

- 2) description of cage, pen; landscaping, shelter; climate; type of nest

III. INCUBATION OF EGG(S)

- 3) date(s) egg(s) laid, hatched, # in clutch; incubation period and techniques; description of hatch(es); mortality rate, probable causes.

IV. RAISING THE YOUNG

- 4) daily weight(s), growth rate, physical development
- 5) diet contents, portions; type and rate of parental delivery and/or self-feeding; stimuli for begging/food presentation and or self-feeding; parent/young relationships; type and frequency of castings and/or stools.
- 6) nest attachments, maintenance; interrelations of young; length of nestling and fledging periods; stimuli for leaving nest; preparatory exercise; mortality rate, probable causes.

V. FLEDGING FOLLOW-UP

- 7) growth and development, stabilized weight, adult diet
- 8) separation from parents, introduction to new environment

VI. REMARKS

- 9) Additional information or detailed article (attach)

(Editor's Note: Members needing to contact Jill on the Avian Data Forms are advised that her new address is : Jill Grade, 2275 W. 25th St., #24, San Pedro, CA 90732)



ZOO News From Japan

By
Yoshi. Yonetani
ZooDEL/Zoo Design & Education Lab
Kobe, Japan

At NogeYama Zoo, Yokohama which act in unison with San Diego-U.S.A. as a sister city, three Clouded Leopards were born on 4 April 1983. It was the first breeding success of this species in captivity in our country.

In order not to disturb the female and her cubs. the Zoo staff used an infrared ray TV set-up for observation.

On the 30th day, the cubs went out into the open air. They were sexed as 1.2. Their average weight is 850g. Passing one month, the mother started to teach them how to eat meat and four days thereafter, they could do it themselves.

Unfortunately, we had bad news when one female died on the 40th day. However, the remaining pair are growing up satisfactorily. By the 70th day their body patterns were clearly defined.

Their father came to Zoo-Yokohama on 6 September, 1980 as an infant. Their mother came on 20 October, 1982 as an adult. The parent's ages are unidentified.

The pair first bred on 4 January 1983. At the beginning of March, the animal keeper noticed a transformation of the female's abdomen. The pregnancy was confirmed at the middle of March. The male was separated from the female on 2 April and a box for delivery was inserted into the female's den area. Two days later, the Zoo staff observed the bright newborns for the first time.



PRIMATOLOGISTS MEETING RECAP

Submitted by Pat Sammarco, Lincoln Park Zoo

Early in August, the American Society of Primatologists met in East Lansing, MI on the Michigan State University campus. This was an exciting week with fine papers presented on all aspects of primatology and gave those attending an opportunity to exchange ideas at formal presentations as well as over tables at the various watering holes. There is a theory that the ability to party increases with specialization, and this seems to have been upheld by the primatologist group.

The roundtable discussion on "A Keeper's Place in Research" with panelists Joe Erwin, Sam Lamalfa, Terry Maple, Betsy O'Donoghue, Jan Raffert, Pat Sammarco and Nan Shaffer instigating the conversations was enthusiastically accepted and led to requests for continuing this format. The next ASP meeting will be in July 1984 in California.

PRIMATOLOGISTS MEETING RECAP, *Continued*

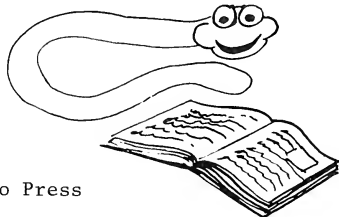
We all have zookeeping in common with each other, but in this time of specialization, many of us are members of groups of more clearly defined interests. We should all do what we can to share our expertise and enthusiasm with our specialists groups, as well as our fellow keepers. In communicating with people who share our eagerness for particular animal families or even species, we can learn more about all aspects of behavior, physiology, psychology and ecology. As keepers we can share some very special views of captive experience, and the intimate knowledge that is special to us.

Some of the concepts approached in the "Keeper's Role in Research" discussions are that when we understand the needs and capabilities of our positions and interests, we can participate in meaningful projects that will benefit us all. Keepers have little time for formal studies, but a lot of information and questions. Researchers need us and our animals as a resource for their studies, and can offer us their time and training. A lot of behavioral and other non-invasive research can answer our questions and probably lead to more.

Keepers who participate in specialist group meetings should be encouraged to set up formal and informal conversations of this kind to share our enthusiasm and learn all we can to improve our knowledge of the animals in our care.



Book Review



The Camel: Its Evolution, Ecology, Behavior and Relationship to Man

By Hilde Gauthier-Pilters and
Anne Innis Dagg

Published by The University of Chicago Press
5801 Ellis Ave., Chicago, IL 60637
Price: \$26.00

*Review by Diane Weinhardt
Lincoln Park Zoo*

The Camel: Its Evolution, Ecology, Behavior and Relationship to Man, is a book that could answer any question you might have about camels. This book deals with the dromedary camel as an animal in its natural way of life. It has little on captive (zoo) management.

The book is divided into two parts. Part one covers evolution, ecology and behavior which includes habitat, feeding, drinking, adaptations to the desert (as a working animal for the nomads), locomotion and loads.

Part two deals with domestication, early history and exportation, nomadism, water supply and the recent uses of the camel. The charts, maps, pictures and very thorough appendix and bibliography supplement the text superbly.

The authors, Hilde Gauthier-Pilters and Anne Innis Dagg, wrote this book from first-hand experience. They took part in many Sahara Desert expeditions with camels from which they gleaned their information.

As an animal keeper who did not know a thing about camels, I found this book very informative.



Legislative News

Compiled by Kevin Conway
Legislative Coordinator

USFWS LISTS 17 FOREIGN REPTILES

The Service has listed 17 species of foreign reptiles as Endangered or Threatened under the Endangered Species Act, as amended (F.R. 6/22/83). This determination provides additional protection to wild populations of these species and allows cooperative research programs to be undertaken on their behalf. The threats that are believed to be causing the declines of these species are habitat destruction, the introduction of non-native predators, exploitation as a source of human food mainly by local people, vandalism, and overcollection. These species were proposed for listing on 20 January, 1983.

Common Name	Scientific Name	Status
Serpent Island gecko	<u>Cyrtodactylus</u> <u>serpensinsula</u>	T
Acklins ground iguana	<u>Cyclura</u> <u>rileyi</u> <u>nuchalis</u>	T
Allen's Cay iguana	<u>Cyclura</u> <u>cyclura</u> <u>inornata</u>	T
Andros Island ground iguana	<u>Cyclura</u> <u>cyclura</u> <u>cyclura</u>	T
Cayman Brac ground iguana	<u>Cyclura</u> <u>nubila</u> <u>caymanensis</u>	T
Cuban ground iguana	<u>Cyclura</u> <u>nubila</u> <u>nubila</u>	T
Exuma Island iguana	<u>Cyclura</u> <u>cyclura</u> <u>figginsii</u>	T
Grand Cayman ground iguana	<u>Cyclura</u> <u>nubila</u> <u>lewisi</u>	E
Jamaican iguana	<u>Cyclura</u> <u>collei</u>	E
Mayaguana iguana	<u>Cyclura</u> <u>carinata</u> <u>bartschi</u>	T
Turks and Caicos iguana	<u>Cyclura</u> <u>carinata</u> <u>carinata</u>	T
Watling Island ground iguana	<u>Cyclura</u> <u>rileyi</u> <u>rileyi</u>	E
White Cay ground iguana	<u>Cyclura</u> <u>rileyi</u> <u>cristata</u>	T
Round Island skink	<u>Leiolopisma</u> <u>telfairii</u>	T
Central American river turtle	<u>Dermatemys</u> <u>mawii</u>	E
Aruba Island rattlesnake	<u>Crotalus</u> <u>unicolor</u>	T
Lar Valley viper	<u>Vipera</u> <u>latifili</u>	E

---Endangered Species Technical Bulletin
Vol. VII, No. 7, July 1983

U.S. ESTABLISHES PANEL TO PROTECT GRIZZLIES

The U.S. Departments of Interior and Agriculture have set up an eight-member Interagency Grizzly Bear Committee to help protect the dwindling number of grizzlies in the continental U.S. Once numbering between 50,000 and 100,000 and ranging over most of the western states, the grizzly population has been reduced to fewer than 1,000 with most of the population occurring in Idaho, Wyoming and Montana. Biologists believe that the threatened species needs help and are concerned that the bear's status is being significantly affected by human activities such as poaching, habitat destruction and disturbance, and recreation.

With better information on grizzly habitat and survival factors needed, the committee will direct research on grizzly bears and help implement state and federal programs to protect the grizzlies and increase their population. The interagency committee replaces the former Grizzly Bear Steering Committee and significantly increases the area to be included in the grizzly bear study and management program (previous committee efforts centered on the Yellowstone ecosystem located primarily in Wyoming). Members of the committee will include foresters from USDA's Forest Service and representatives of DOI's Fish and Wildlife Service, the National Park Service, and the states of Idaho, Wyoming and Montana.

---ECOLOGY USA, June 1983

CITES LISTS AMENDMENTS

In a 5 July Federal Register notice, the Fish and Wildlife Service announced the decisions of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) regarding amendments to Appendices I and II. The U.S. delegation did not vote against any of these proposals; however, they abstained from voting on some of them. The amendments became effective on 29 July 1983.

<u>SPECIES</u>		<u>ADOPTED AMENDMENT</u>
PRIMATES		
<u>Lagothrix flavicauda</u> (yellow-tailed woolly monkey)		Transfer from II to I
CETACEA		
<u>Balaenoptera acutorostrata</u> (mink whale) All populations except that of West Greenland (entry into force 1/1/86)		Transfer from II to I
<u>Balaenoptera edeni</u> (Brydes whale)		Transfer from II to I
<u>Berardius spp.</u> (beaked whales)		Transfer from II to I
<u>Caperia marginata</u> (pygmy right whale) (entry into force 1/1/86)		Transfer from II to I
<u>Hyperoodon spp.</u> (bottle-nosed whales)		Transfer from II to I
CARNIVORA		
<u>Vulpes velox hebes</u> (northern swift fox)		Remove from I
<u>Ursus arctos</u> (brown bear) Italian population		Transfer from I to II
<u>Ursus arctos</u> (brown bear) European population except USSR		All to II
PERISSODACTYLA		
<u>Equus africanus</u> (African wild ass)		Add to I
ARTIODACTYLA		
<u>Moschus spp.</u> (musk deer) populations of Afghanistan, Bhutan, Burma, India, Nepal and Pakistan.		Add to I
<u>Moschus spp.</u> (musk deer) all populations except those in Appendix I		Add to II
<u>Addax nasomaculatus</u> (addax)		Transfer from II to I
<u>Ammotragus lervia</u> (aoudad, Barbary sheep)		Add to II
<u>Cephalophus dorsalis</u> (bay duiker)		Add to II
<u>Cephalophus jentinki</u> (Jentink's duiker)		Add to II
<u>Cephalophus ogilbyi</u> (Ogilby's duiker)		Add to II
<u>Cephalophus zebra</u> (zebra-backed duiker)		Add to II
<u>Gazella dama</u> (dama gazelle)		Add to I
<u>Oryx dama</u> (scimitar-horned oryx)		Transfer from II to I
<u>Ovis canadensis</u> (bighorn sheep) populations of Canada and the United States		Remove from II

LEGISLATIVE NEWS, Continued

SPECIES

ADOPTED AMENDMENT

STRUTHIONIFORMES

Struthio camelus (ostrich) populations of
North Africa

Add to I

PELECANIFORMES

Pelecanus crispus (Dalmatian pelican)

Transfer from I to II

CICONIFORMES

Phoenicopteridae spp. (flamingos) all species
not previously listed in appendices

Add to II

ANSERIFORMES

Anser albifrons gambelli (tule goose)

Remove from II

Oxyura leucocephala (white-headed duck)

Add to II

GRUIFORMES

Anthropoides virgo (demoiselle crane)

Add to II

CHARADRIIFORMES

Numerius tenuirostris (slender-billed curlew)

Transfer from II to I

PSITTACIFORMES

Ara glaucogularis (=canine) (caninde macaw)

Transfer from II to I

Ognorhynchus icterotis (yellow-cheeked conure)

Transfer from II to I

Ara rubrogenys (red-fronted macaw)

Transfer from II to I

CROCODYLIA

Crocodylus niloticus (nile crocodile)
population of Zimbabwe subject to ranching

Transfer from I to II

SERPENTES

Epicrates monensis (Mona boa)

Transfer from II to I

ACIPENSERIFORMES

Acipenser fulvescens (lake sturgeon)

Remove from II

Acipenser sturio (Baltic sturgeon, European
common sturgeon)

Transfer from II to I

SALMONIFORMES

Coregonus alpenae (longjaw cisco)

Remove from I

PERCIFORMES

Stizostedion vitreum glaucum (blue pike)

Remove from I

---AAZPA Newsletter
August 1983

WETLANDS PROTECTION PROPOSED

Legislation to expand the nation's wetlands acquisition program is scheduled for action in both House and Senate Committees this fall. In the Senate, the Environmental Pollution Subcommittee held field hearings in August on S 1329, which would provide more than \$1 billion for wetlands acquisition over the next ten years. The bill, sponsored by subcommittee chairman John Chaffee (R/RI), has three major goals:

¶¶ It would continue the current wetlands acquisition program under the Wetlands Loan Act. Chaffee's bill extends the Act to continue loans to the duck stamp fund to speed up wetlands acquisition. It also deletes the provision requiring repayment of the loans from 75% of the annual duck stamp receipts. This allows the Fish and Wildlife Service to continue using the duck stamp monies to purchase wetlands.

¶¶ It would provide additional money to sharply increase wetlands acquisition. Most important, Chaffee's bill automatically allocates \$74 million a year for ten years from the Land and Water Conservation Fund for wetlands acquisition. It also increases acquisition funds by doubling duck stamp fees over the next five years, charging entry fees at some national wildlife refuges, and earmarking duties on guns and ammunition for wetlands acquisition.

¶¶ It would require a study of wetlands destruction by federal agencies to determine the best approach for reducing these losses.

In the House, the Merchant Marine Committee will take up HR 3082, sponsored by Rep. Edwin Forsythe (R/NJ). The original bill was nearly identical to the Chaffee bill, but the Fisheries and Wildlife Subcommittee made several changes when it reported HR 3082 in late July.

On the plus side, the subcommittee followed the lead of the Chaffee bill and agreed to forgive the loans under the Wetlands Loan Act. On the down side, the subcommittee changed the provision that would have automatically withdrawn \$75 million a year from the LWCF. Now the money would be provided only if Congress appropriates it each year. It also allows the states to use these funds for non-acquisition purposes.

In addition, the subcommittee failed to adopt a measure, proposed by the Environmental Defense Fund and NWF, to begin immediately to eliminate federal encouragement of wetlands destruction. Federal agencies would be required to identify any expenditures or financial assistance that encourages conversion of wetlands and, consistent with existing laws, to avoid those activities to the maximum extent practicable. NWF will continue to press for the inclusion of this measure.

from Conservation '83

ADENDUM FROM ECOLOGY USA -- The most significant amendment tacked on to the House bill during subcommittee markup altered the allocation formula determining the amount of money each state will receive for wetlands acquisition. Under the amended bill, each state's allocation will be based on half of the amount it spent for wetlands acquisition during the most recent fiscal year and half on its proposed plan to carry out wetlands conservation projects. Two-thirds of the \$75 million set aside for wetlands acquisition from the LWCF would be distributed to the states under the revised formula. The remaining monies would be allocated to the Interior Dept. for wetlands acquisition or enhancement projects under a national wetlands priority conservation plan.



CONDOR UPDATE

(Editor's Note: The following article is a compilation of material from several sources including the Education Dept. of the San Diego Zoo, U.S. Fish & Wildlife Service, "Condor Update" written by Dr. Arthur C. Risser, General Curator/Ornithology at the San Diego Zoo and from material sent to AKF by Heidi Ensley, treasurer of the San Diego Zoo AAZK Chapter. We thank all of the contributors for making this update article possible.)

To the Pacific Coast Indians, the California condor was a "Thunderbird." They thought the great birds caused the skies to shake by flapping their wings. Condors played a leading role in Indian mythology and religious ceremonies. Considered sacred because they represent immortality, the condor's likeness was often painted on cave walls by the Indians.

Like all vultures, California condors (*Gymnogyps californianus*) are carrion eaters. They prefer the flesh of deer, cattle, or sheep but will also eat dead rodents, fish and birds. After eating, they clean their heads and necks by rubbing them on grass. Condors also bathe frequently and then spend hours preening and drying their feathers. If their meal has been a particularly filling one, condors may have to spend hours on the ground or on a low branch before they can take off.



A prehistoric Indian drawing of a condor was found in a cave near Santa Barbara, CA. At that time, the condor's range covered much of what is now called the West.

California condors are the largest birds in North America. They may weigh up to 25 lbs. and have wingspans of 9½ feet. A California condor can live 20 years or more in the wild and at least 45 years in captivity. They are members of the New World vulture family and are related to storks. Condors nest in caves or clefts on cliffs that usually have nearby branches for roosting and a clear approach for easy landings and takeoffs.

The huge vultures have naked heads and necks, dull gray-black feathers, and claws instead of true talons. While not noted for their beauty on the ground, in the air they are a magnificent sight. Condors can soar on warm thermal updrafts for hours, reaching speeds of 35 m.p.h. and altitudes of 15,000 feet. A diamond-shape patch of white adorns the undersides of their wings.

Condors probably were never very numerous, although the species' range once extended along the entire Pacific Coast from British Columbia to Baja California. Fossils also have been found in Texas and Florida. Now, however, they are confined to Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles and Kern Counties in California, where they are protected by California and U.S. law.

Condors have a low reproductive rate. They lay a single egg, although a second (and recently discovered, a third) egg may be produced if the previous egg is lost. If a pair successfully fledges a chick one year, they may not breed the following year. Chicks stay with their parents for more than a year, retain juvenile plumage until about age five, and apparently do not pair until they are six or older. Even then, inexperienced birds may not successfully breed and lay an egg until they are eight or older. This natural rate of production is apparently insufficient to replace the number of condors that die.

CONDOR UPDATE, Continued

Until recently, no one could provide good estimates on how many California condors existed. One estimate in the early 1940's placed numbers at near 100. The population was estimated at 50 to 60 birds in the early 1960's and at 25 to 30 birds in the late 1970's. Today, scientists count no more than 20 individuals in the wild.

The precise reason, or reasons, for the condor's decline is unknown. In the past, eggs were taken for private collections and young and adult condors were killed by ranchers who mistakenly believed the birds killed livestock. More recently, roads, cities, housing tracts, and weekend mountain homes have replaced much of the wilderness and ranchland that California condors need to find food and isolated nesting sites. Pesticides and pollution also may be implicated in the condor's decline. Whatever the reason for the steady decline, by 1979 the trend was clear and ominous: the California condor faced extinction unless drastic action was taken.

Efforts to protect and preserve the condor have been plagued by differences of opinion and fighting among agencies for many years, with such groups as Friends of the Earth calling for an absolute hands-off approach. It is their opinion that twenty birds represent a stable population, and, if left alone, will recover without intervention by man. In the early 1950's, when the San Diego Zoo put in a bid to trap a pair of condors for captive breeding, it was the National Audubon Society whose strong objections brought about the cancellation of the permit. This approach was attempted when there were still about sixty condors left. Had recovery efforts started forty years ago when there was a larger population, we might not now be facing the last-ditch efforts in which we are now engaged. Perhaps no other species has been plagued by biopolitics as has the California condor.

Several bodies deliberate on the condor problem. One of these is the California Condor Task Force. This group is composed of the U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management, U.S. Forest Service, California Department of Fish and Game, and the National Audubon Society.

Last year, another body was formed with the purpose of deliberating on the biological aspects of the entire condor program, especially as it pertains to captive breeding and reintroduction. This informal group, the California Condor Working Group on Captive Breeding and Reintroduction, is composed of representatives of the USFWS, National Audubon Society, Patuxent Wildlife Research Center, Los Angeles Zoo and San Diego's Zoo and Wild Animal Park, with a State Fish and Game representative as observer. This group considers all aspects of condor research; it drafts and makes recommendations to the USFWS and the State Fish and Game Commission. One of the primary concerns of the working group is the rapid establishment of a captive flock before further loss of the wild population occurs (present attrition rate seems to be one or two birds a year). The more rapidly the captive flock is established, the greater chance captive-raised offspring will have of being released into an existing wild population from whom they can learn the ways of the wild condor.

To save condors from extinction, three major aspects must be addressed: 1) preserve and protect the habitat utilized by condors; 2) gather basic biological information through field research; and 3) establish a captive population of condors for breeding purposes, offspring of which can be released in the wild. It is this third aspect in which the San Diego Zoo and Wild Animal Park, as well as the Los Angeles Zoo, are primarily engaged.

The captive breeding portion of the California Condor Recovery Project actually began on 13 August 1982, with the rescue of one chick from the wild. Under the Emergency Procedures Guidelines, authorities were given the responsibility of removing a condor chick suffering from parental neglect.

CONDOR UPDATE, *Continued*

Xol Xol (or Hol Hol) was an immature bird, and it was subsequently removed and taken to the San Diego Wild Animal Park in August 1982. In December 1982, another immature condor was also rescued and moved to the Los Angeles Zoo. This second condor was captured during a radio-telemetry operation and because the bird appeared to be in questionable health, precautions were taken to optimize its condition. It was eventually left at the Los Angeles facilities and named Paxa. It had been hoped that this condor would be a prospective mate for Topa topa, a sixteen-year-old male already in captivity. However, Hol Hol soon joined Paxa at L.A. and both were sexed as males.



During this period, two other birds were also captured, but released with radio-transmitters. One was an adult and the other an immature, and both through blood tests were found to be males.

In 1983, three of the four wild nesting sites were located and diligently observed. All three produced first-clutch eggs, which were pulled and removed to the San Diego Zoo propagation center for hatching, and then relocation to the Wild Animal Park's "Condorminium". The fourth egg was a second-clutch egg from the first pair.

The first California condor chick to be hatched in captivity was 1.0 Sisquoc who was hatched on 30 March 1983. The second chick, 0.1 Tecuya was hatched on 5 April 1983. The third, 0.1 Sespe hatched on 25 May 1983. This was the second-clutch sibling of Sisquoc. She was pulled because of the parental history of squabbling over incubation rights. There was concern over this egg because it had gone some hours without parental incubation before retrieval. The fourth chick hatched in captivity this season was 0.1 Almiyi who hatched on 27 May.

According to Arthur C. Risser, Jr., General Curator/Ornithology of the San Diego Zoo, "Incubation, hatching and rearing efforts, thus far, have been successful; and boundless credit goes to some highly skilled, patient and devoted keepers. The successes, however, have truly been the result of a total Society involvement, because there were countless contributors from so many departments along the way. It was gratifying to see how quickly things got done, often at emergency level, because of the sense that whatever was required would be of help to the condors."

All four California condor chicks hatched this spring continue to thrive at the Wild Animal Park "Condorminium". Research Department Technician Arlene Kumamoto examined chromosomes of the chicks to determine their sex. With one exception, these results were corroborated by Arden Bercovitz, who examined the fecal remains in the hatched shell for hormones. This technique, if it proves accurate through further testing, will provide early sexing determination of condor chicks hatched in captivity.

It is encouraging to note that California condors have successfully hatched two young in the wild. One of these chicks was produced from a third egg laid by the parents, the first having been removed for captive hatching and the second apparently lost to raven predation. This indicates that the birds will lay up to three eggs (maybe more) if eggs are removed from the nest.

CONDOR UPDATE, Continued

A fourth nest site was discovered with a first-clutch hatchling on 4 August 1983. However, the nest site was in a precarious position on a sheer cliff, and a black bear was observed patrolling the area. A decision was made to pull the jeopardized youngster and it was transported to and now resides at the Los Angeles Zoo. It was named Cuyama and its sex is pending. By removing this chick prior to fledging, there is increased likelihood that the parents will nest again next year.

The young from these wild eggs and an immature male at the Los Angeles Zoo represent the genetic strain of four of the five known breeding pairs of California condors, important knowledge so that inbreeding can be avoided.

According to Dr. Risser, "We are engaged in a long-term program. Condors do not reach sexual maturity until they are seven or eight years old and even though we may eventually have five captive pairs (distributed both in Los Angeles and San Diego), we must anticipate incompatibility problems which will have to be sorted out. The chicks hatched this year will not be old enough to breed until at least 1990. If Topa-Topa, the 16-year-old male at Los Angeles, gets a mate of suitable age this year, young from this captive pair might be produced in 1984, but this is an uncertainty. There will, therefore, be a long waiting period before the other pairs get into production with offspring which can supplement the wild population. A forty-year program is, therefore, not unrealistic.

The wild pairs, as you can see, are vital in the whole picture. Through manipulation of their eggs, it will be possible to develop a captive flock of known genetic stock. If permission to manipulate them in the future is continued, their production might be increased and their offspring raised in captivity (as we are doing this year) then be put back in the wild sooner than expected. (Through the taking of eggs from wild nests for artificial incubation in captivity, the condor population has been increased by six birds this year, whereas two would be considered normal production.) All these aspects fall directly into the political arena, to be decided upon at each step. The program will, therefore, continually be faced with uncertainties and even unanticipated changes brought about by the ultimate decision makers. Such conditions make annual planning extremely difficult and highly frustrating."



Gymnogyps californianus

Hopefully, by continuing the successful approach taken this year in the future, there can be guarded optimism for the California condor population's survival.

How can you help to save the California condor? There are several things you can do to help the California condor: (1) LEARN as much as you can about this magnificent bird; (2) TELL your friends and family about the condor; and (3) If you agree with what is being done to help save the California condor, WRITE LETTERS of support to the California Condor Program: U.S. Fish & Wildlife Service, Dept. of the Interior, Washington, D.C. 20240; Information Office,

California State Fish and Game Commission, 1416 9th Street, Sacramento, CA 95814; or National Audubon Society, California Condor Research Center, 87 North Chestnut Street, Ventura, CA 93001.



We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ASST. SUPERVISOR/ANIMAL SERVICES...responsible for reptile collection and supervision of staff. Degree in biology, zoology, or related field, with minimum of 2 years' reptile management preferred. Salary \$10,992/year. Send resume to Frank Ward, Personnel Department, East Wing, City Hall Building, Norfolk, VA 23501. Applications must be received before November 8, 1983.

ELEPHANT KEEPER...responsible for basic husbandry/training of female Asian elephant. Full-time elephant experience and references essential. Salary \$5.63/hr., plus benefits. Submit resume to Ed Posey, General Curator, Central Florida Zoological Park, P.O. Box 309, Lake Monroe, FL 32747.

The following job listings were sent directly to the editorial offices of *Animal Keepers' Forum* for inclusion in this section. Institutions wishing to advertise job openings in AKF are asked to please submit the necessary data and job requirements by the 15th of each month.

ASSISTANT ZOO MANAGER...requires BS in Zoology or other applicable life science major. Experience should include custodian care of wild animals and maintenance of zoo buildings, grounds and related facilities. Management experience essential. Salary range \$1933-\$2350. Apply to City of Fresno, Personnel Office, 2348 N. Mariposa, Fresno, CA 93721. Filing deadline is 31 October 1983.

ZOO ATTENDANT I...Required high school diploma and minimum of one years' experience working with exotic animals. Salary range \$1189-\$1428. Apply to City of Fresno, Personnel Office, 2348 N. Mariposa, Fresno, CA 93721. Filing deadline is 31 October 1983.

ANIMAL KEEPER I...requires own transportation, one year of paid experience in care and handling of a variety of animals or 6 months' animal care experience in a zoological institution. Send resume and salary requirements to Everett Butler, Lion Country Safari, P.O. Box 16066, West Palm Beach, FL 33406.

ANIMAL KEEPER...work with general collection in a new, growing, society-operated facility. Salary \$4.55 per hour. Send letter and resume to: Binder Park Zoo, 7400 Division Drive, Battle Creek, MI 49017.

o
p
p
o
r
t
u
n
i
t
y
k
n
o
c
k
s

MOVING????

Please send complete change of address to:

Dolly Clark, Administrative Secretary
National Headquarters
American Association of Zoo Keepers
635 Gage Blvd., Topeka, KS 66606

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

Animal Keepers' Forum



dedicated to Professional Animal Care

NOVEMBER 1983



Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Associate Editor: Bernie Feldman

NOVEMBER 1983
 VOLUME TEN
 NUMBER ELEVEN

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

AMERICAN ASSOCIATION OF ZOO KEEPERS, INC.
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
 Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Kevin Conway, NZP/Conservation & Research Center Front Royal, VA 22630	President
Jean Hromadka, San Diego Wild Animal Park Escondido, CA 92025	Vice President
Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614	
Mike Carpenter, Phoenix Zoo, Phoenix, AZ 85010	
Verona Barr, Miller Park Zoo, Bloomington, IL 61701	

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u> <u>Patti Kuntzmann, Lincoln Park</u> <u>Continuing Keeper Education</u> <u>Judie Steenberg, Woodland Park</u> <u>Historical Committee</u> <u>Larry Sammarco, Lincoln Park</u> <u>Professional Standards Committee</u> <u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Coordinator for International Affairs</u> <u>Randy Adolph, St. Louis Zoo</u> <u>Research/Grants Committee</u> <u>Frank Kohn, National Zoological Park</u> <u>Awards Committee</u> <u>Mike Crocker, Dickerson Park Zoo</u> <u>Legislative Action Committee</u> <u>Kevin Conway, NZP/CRC, Front Royal</u>
---	---

PROJECT HEADS

<u>Staff Exchange</u> <u>Elandra Aum, Woodland Park</u> <u>Animal Data Transfer Forms</u> <u>Bernie Feldman, Topeka Zoo</u> <u>Program Library</u> <u>Mike Crocker, Dickerson Park</u> <u>Infant Development</u> <u>Steve Taylor, Louisville</u> <u>Keeper Accomodations List</u> <u>Oliver Claffey, Metro Toronto</u>	<u>Library Resource/Book Review</u> <u>Ellen Leach, Woodland Park</u> <u>Biological Values Booklet/Gestation</u> <u>Mary Mure, San Francisco Zoo</u> <u>Diet Notebook</u> <u>South Florida Chapter, Miami</u> <u>Membership Directory</u> <u>Pat Sammarco, Lincoln Park</u> <u>Exhibit Design</u> <u>Diane Forsyth, Akron Zoological Park</u>
---	--

Keeper Data Survey

Mary Slaybaugh, San Antonio & Dave Orndorff, Sea World Shark Institute

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Linda Rohr Vacancy Gene Pfeiffer Angela Keppel Lee Payne Lynne Villers Larry Sammarco Vacancy Alan Sharples Vacancy Candy Kroft Laurence Gledhill Joanie Stinson Vacancy	W.D. Stone Memorial Zoo Philadelphia Zoo National Zoo Detroit Zoo Indianapolis Zoo Lincoln Park Zoo Atlanta Zoo Rio Grande Zoo Woodland Park Zoo Phoenix Zoo	ME, VT, NH, MA, RI, CT NY PA, NJ, MD, DE VA, W. VA, D.C. MI IN, OH, KY WI, IL, MO, MN, IA TN, NC, SC FL, AL, GA AR, MS, LA TX, NM, CO, OK, KS, NE, SD, ND WA, OR, ID, MT, WY, AK CA, NV, AZ, UT, HI Canada
---	---	--

This month's Keeper Artist is Cathy Taibbi, a Hoofed Mammal /Elephant Keeper at the Atlanta Zoo. Cathy's drawing is of a mother Coati Mundi and her babies. An article on the Coati Mundi breeding program at the Atlanta Zoo appears on page 337 of this issue of AKF. Thanks, Cathy!

Scoops and Scuttlebutt *from the President*

Dear Fellow Members,

A more complete report of the board meetings will be published in the proceedings of the conference, but I wanted you all to know that the Philadelphia Chapter gave us a great professional meeting.

The historic theme of the presentations showed us how our zoos have progressed and how we have developed our professional skills and attitudes. The Philadelphia Zoo is a wonderful tour of zoo heritage. Exhibits show some of the best concepts of each era in zoo architecture and design, and are leading to the most current attitudes in zoo keeping and public education. The tour of the Brandywine Zoo showed us the contrasts of a small zoo's progress and the directions unique to each zoo.

AAZK itself is progressing, with member activity in the various committees giving us the information we need to improve our animal care techniques and add to our zoo keeping knowledge. The most active pursuit is the development of the committee for Continuing Keeper Education. With all its sub-committees, the team will be assessing sources of existing information, preparing channels of exchange, and creating materials for our education. The video-tape on safety was previewed with rave reviews, and distribution promised within months. More tapes will be coming, their topics meant to fulfill a long-standing agreement for AAZK to develop materials to compliment AAZPA's training manual. We will also begin working towards writing a guide to Zoo Keeper husbandry fundamentals. This will be a year for the Education Committee that we all can be excited about.

Although the film project "Looking to the Future" has been put aside as financially impractical, a project has been started to define the Zoo Keeper's role in public education. Understanding our limits and potential value to other zoos and extra-zoo activities was the theme of two stimulating roundtable discussions--"The Zoo Keeper's Role in Research" and "Species Survival Plan: What It Is and How It Affects Keepers".

Besides the mental exercise provided by papers, workshops, and waterhole conversation, physical activity included both volleyball and soccer, internationally based with the Britains challenging the U.S. Keepers.

Awards were made to recognize the contributions of Keepers to AKF (see listing page 298-299 October issue). Ed Roberts was honored with a Distinguished Service Award and lifetime membership for his contributions as long-time member, conference presenter, Regional Coordinator and past president. The Louisville Chapter collectively and Steve Taylor, individually, were honored for their five years of providing symposia. Brookfield Chapter was recognized for their efforts in initiating the Career Brochure.

SCOOPS AND SCUTTLEBUTT, Continued

Allen Foust of the Turtle Back Zoo was presented a Meritorious Achievement Award for outstanding contribution in the field of wildlife conservation and animal husbandry.

Excellence in Zoo Keeping Awards were made to honor the professional commitment of Judie Steenberg, Woodland Park, and Bob Wolf, Los Angeles.

The words beyond "Thank You" were unavailable as you presented me with a certificate of appreciation for my presidency. You all know how much Zoo Keeping and Zoo Keepers mean to me, and should understand the combination of pride and humility that I feel with your recognition. Thank you all for allowing and helping me to contribute to our professional association.

Sincerely,

Pat Sammarco



Coming Events

THIRD ANNUAL DR. SCHOLL CONFERENCE ON THE NUTRITION OF CAPTIVE WILD ANIMALS

December 2-3, 1983

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Grand Rapids, MI

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Sacramento, CA

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

April 15-17, 1984

Omaha, NE

AAZK SOUTHEASTERN REGIONAL CONFERENCE

April 19-21, 1984

Columbia, SC

Hosted by the Riverbanks Zoo AAZK Chapter. Registration fee is \$25.00 for members and \$30.00 for nonmembers. Contact person at Riverbanks Zoo is Stephen J. Danko. Watch AKF for registration forms and information.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

April 29-May 1, 1984

Philadelphia, PA

Births & Hatchings

BRONX ZOO.....Margaret Price

B&H at the Bronx Zoo for the months of August and September 1983 include: Mammals - 4.0 Patagonian cavy, 0.1 Gaur, 0.2 Thomson's gazelle, 0.1 Grevy's zebra, 6.0 Bushy-tailed jird, 0.1 Sable antelope, 1.0 Yak, 2.0 Lesser long-tongued bat, 5.- Pen-tailed bettong, 2.0 Axis deer, 5.0 Collared peccary, 0.2 Blackbuck, 2.0 Saddleback tamarin, 1.0 Formosan sika deer, 3.0 Guanaco, 1.1 Wisent, 0.1 Red brocket deer, 4.0 Capybara, 1.0 Mouflon, 1.0 Hammer-headed bat, 1.0 White-handed gibbon and 0.1 Reeves muntjac; Birds - 7 Crested tinamou, 1 Palawan peacock pheasant, 1 Green wood hoopoe, 2 Malayan fairy bluebird, 1 American barn owl, 5 American ruddy duck, 2 Andean gull, 1 Caribbean Chilean flamingo, 7 Rothschild's mynah, 3 Black-winged stilt, 3 Golden-breasted bunting, 2 Tufted puffin, 1 Green jungle fowl, 2 White-quilled black bustard, 3 Mauritius pink pigeon, 5 Ringed teal, 1 Black-rumped hemipode, 2 Northern masked weaver, and 2 Crested quail dove; Reptiles - 30 Hispaniolan boa, 1 South American big-headed turtle, 11 Black-lipped cobra, 1 Eastern painted turtle and 3 Eastern box turtle.

JACKSONVILLE ZOO.....Anne Wiggins

The following are the B&H for January-September 1983: Mammals - 1.4 Pygmy goat, 1.2 Sitatunga (1 DNS), 0.0.10 Capybara (5 DNS), 1.2 Eland (1 DNS), 0.2 Guanaco, 0.1 White rhino (DNS), 0.2 Ring-tailed lemur, 2.0 Hartbeest (1 DNS), 0.1 Cape Buffalo, 0.1 Sable antelope and 0.1 Grant's zebra: Birds - 12 Masai ostrich (5 DNS), 3 Sacred ibis (1 DNS), 4 Leadbeater's ground hornbill (1 DNS), 2 Sulphur-crested cockatoo (1 DNS), 3 Kookaburra (1 DNS), 1 Pondicherry vulture, 1 Lesser magellan goose, 2 Abyssinian blue-winged goose (1 DNS), 1 Demoiselle crane, 20 Vulture guinea fowl, 62 Golden pheasant (16 DNS), 5 Mandarin duck (2 DNS), 4 Indian spotbill duck (1 DNS), 20+ Indian peafowl, 5 Peach-faced lovebird, 2 Yellow-collared macaw (2 DNS), 4 Illiger's macaw (4 DNS), 2 Rothschild's mynah (2DNS), and 20 Wild turkey; Reptiles - 2 New Guinea snake-necked turtle (1 DNS), 6 Nile crocodile (1 DNS), 4 Eastern musk turtle, 4 Leopard gecko and 1 Amazon tree boa.

SAN DIEGO ZOO AND WILD ANIMAL PARK.....Jody Courtney

Selected B&H for August 1983 include: Mammals - 1.1 Barasinga deer, 3.1 Arabian oryx, 0.1 Hartmann's mountain zebra, 0.2 Addax, 0.2 Scimitar-horned oryx, 2.2 Asian lion, 1.0 Okapi, 1.0 Addra gazelle and 0.0.2 Pygmy marmoset; Birds -- 0.0.4 Malay argus pheasant, 0.0.2 Renauld's ground cuckoo, 0.0.2 Eyton's whistling duck, 0.0.4 Kenya crested guinea fowl, 0.0.3 Black-breasted button quail and 0.0.2 Amboina king parakeet; Reptiles -- 0.0.4 Aruba rattle snake.

DALLAS ZOO.....Tami Jones

September 1983 B&H include: Mammals - 0.0.5 Patagonian cavy, 0.1 Dama gazelle, 0.1 Sable antelope (DNS), 0.1 Axis deer; Birds - 0.0.5 Red-vented bulbul, 0.0.4 Society finch, 0.0.1 West African crowned crane, 0.0.4 White-headed piping guan, 0.0.1 Gouldian finch, 0.0.1 Oriental turtle dove (DNS); Reptiles - 2 South African chameleon (*Bradypodium ventrale*) 0.0.2 Australian snapping turtle (*Elseya latisternum*) 1.0 Central American kingsnake (*Lampropeltis triangulum polyzona*).

BIRTHS AND HATCHINGS, Continued

LINCOLN PARK ZOO.....Randy McMahon/Susan Moy

The following are the September 1983 B&H: Mammals - 0.0.2 Lowland gorilla, 0.1 Chimpanzee, 0.0.2 Pygmy marmoset, 0.0.1 Squirrel monkey, 0.0.1 Celebes black ape, 0.0.1 Paca, 0.0.1 La Plata three-banded armadillo, 1.0 Addra gazelle, 0.0.1 Grevy's zebra (miscarriage); Birds - 0.0.1 Double-striped thick-knee, 0.0.1 Nicobar pigeon, 0.0.2 Jackson's hornbill, 0.0.1 Silver beaked tanager (DNS), 0.0.3 Golden-breasted starling (DNS), and 0.1 Superb starling.

TAMPA--BUSCH GARDENS.....Sandy Moher

B&H for September 1983 include: Mammals - 1.0 Kafue (red), 0.1 Chimpanzee, 1.1 Sable antelope, 1.3 Grant's gazelle, 0.0.1 Grivet monkey, 1.1 Scimitar-horned oryx, 0.1 Zambesi red lechwe, 0.0.1 Guinea (western) baboon, 1.0 Muntjac; Birds - 2 Red-crested touraco, 1 Chattering lory, 1 Mexican military macaw, 5 Scarlet ibis, 7 Eyton's tree duck, 5 Indian peafowl (blue phase), 3 Jandaya conure, 1 Golden-mantled rosella, 4 Ringed teal, 2 Goldie's lorikeet, 3 Cockatiel; Reptiles - 39 American alligator.

BROOKFIELD ZOO.....John S. Stoddard

September 1983 B&H include: Mammals - 0.0.5 White-toothed shrew, 0.0.4 Degu, 0.0.1 Callimico, 0.0.1 Mandrill; Birds - 0.0.4 Grey-headed kingfisher (fledged), 0.0.1 Blue-grey tanager; Herps - 0.0.9 Arrow poison frog, 0.0.2 Hingeback tortoise and 0.0.4 Western diamondback rattlesnake.

MEMPHIS ZOO.....Robert L. Evans

B&H at the Memphis Zoo for September 1983 are: Mammals - 1.0 Llama; Birds - 0.0.1 Luzon bleeding heart dove, 0.0.4 Peachick, 0.0.1 Roul roul, 0.0.4 Ostrich, 0.0.2 Chestnut-breasted manakin; Herps - 0.0.2 Leopard gecko and 0.0.18 Madagascan ground boa.

TURTLE BACK ZOO.....Jay Jasan

The following are the B&H from July through September 1983: 0.1 American elk, 0.1 Llama, 1.0 Domestic yak, 0.0.3 Laysan teal, 0.0.6 South American red-eared turtle and 0.0.3 Musk turtle.

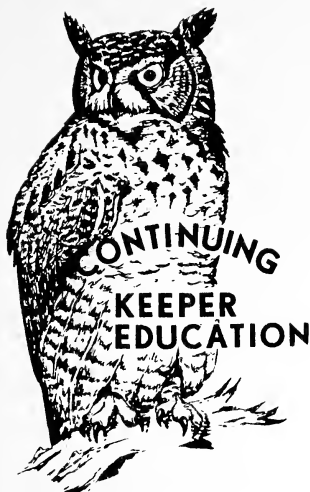
LITTLE ROCK ZOO.....Chris Rasums

The third quarter of 1983 produced the following infants: Mammals - 1.0 Hanuman langur, 1.0.1 Squirrel monkey, 3.0 Jaguar, 1.0 Binturong, 2.0 Blackbuck, 1.0 Guanaco, 1.1 Serval, 0.0.3 Capybara, 0.1 Zebra, 1.0 Scimitar-horned oryx, 0.1 Ocelot; Birds - 1.2 Black swan, 0.0.1 Red-crested cardinal, 0.0.1 Fulvous whistling duck and 0.0.4 Peafowl.

ASSINIBOINE PARK ZOO.....Barb Hoffmer

B&H for July, August and September 1983 include: Mammals - 1 Formosan sika, 0.1 Pere David's deer, 2.1 Llama, 1 Alpine ibex, 1.0 Black fallow deer, 1.0 Mule deer, 1 Grey gibbon, 1 Western Canadian porcupine, 2 Variegated spider monkey, 0.1 California bighorn, 1 Parma wallaby and 1.0 Spectacled langur; Birds - 1 Palm tanager, 2 Blue-grey tanager, 3 Snowy owl, 1 Ostrich, 5 Peafowl, 1 Cormorant, 14 Guinea fowl, 1 Yellow oriole, 2 Silky chicken and 1 Crested bronze-wing pigeon.





AAZK KEEPER TRAINING VIDEO TAPES

By
Wayne Buchanan
Education Committee
Video Tape Project

In October 1982, the newly formed Education Committee of the AAZK committed itself to the production of a pilot video tape for the training of zoo keepers; this project is now complete. The subject of this tape is keeper safety. It promotes a safety approach to the job of zoo keeping rather than attempting to deal with the numerous and variable specifics of this subject.

Eventually, we hope to produce a series of tapes to aid in the training of new keepers. The tapes will be created by keepers nationwide. In this manner, we hope to take advantage of the diverse expertise of our membership.

Method of distribution of the tapes will be drafted at the 1983 AAZK National Conference. It will entail a nominal rental fee with limited duplication rights granted. Information on the availability of the tape will appear in future issues of Animal Keepers' Forum and the AAZPA Newsletter.

AAZK EDUCATION COMMITTEE QUESTIONNAIRE

If your zoo was not represented at the National AAZK Conference in Philadelphia, please fill out the following questionnaire and mail it to Judie Steenberg, Woodland Park Zoological Gardens, 5500 Phinney Ave., North, Seattle, WA 98103 by December 1, 1983.

NAME: _____ POSITION: _____

ZOO: _____

Have you read the "Continuing Keeper Education" column in AKF this past year? YES _____ NO _____

If so, did you find it informative? YES _____ NO _____

Comments: _____

Do you have suggestions for future articles? _____

Does your Zoo have any of the following audio-visual equipment?

☐ video recorder ☐ video camera ☐ slide projector
☐ movie projector ☐ movie camera ☐ tape recorder
☐ computer equipment

CONTINUING KEEPER EDUCATION, Continued

AAZK EDUCATION COMMITTEE QUESTIONNAIRE (continued)

Does your Zoo have a library? _____ YES _____ NO

Does it have literature on Keeper training and/or animal management?

_____ YES _____ NO

Please list references: _____

Which of the following basic Keeper training video-tapes would you like to see produced. Please number them 1,2,3, etc. in order of preference.

_____ additional safety tapes	_____ parasitology
_____ feeds/feeding	_____ communications/records
_____ tool use/storage	_____ I.D./Marking
_____ sanitation/pest control	_____ exhibit maintenance
_____ The Keeper's Role in Zoo Animal Health (2 tapes_	
_____ Other: _____	



BIOLOGICAL VALUES COMMITTEE SEEKS MEMBER INPUT

The Committee working on the Revised Second edition of "Biological Values for Selected Mammals" would appreciate any interested persons supplying information listed below on any mammal species with which they are familiar. (Source material should be identified) All responses will be gratefully acknowledged. Please send all correspondence and information to: Mary Mure, c/o San Francisco Zoo, Sloat Blvd. at the Pacific Ocean, San Francisco, CA 94132.

Name (Common and Scientific)
Range
Size (Male and Female)
Weight (Male and Female)
Estrus Cycle (Receptive days, etc.)
Gestation
Litter size
Weaning
Sexual Maturity (Male and Female)
Lifespan
Body temperature
Respiration and Pulse Rate
Male, Female and Young called





Bird Calls

THOSE CRAZY CRANES

By
Jill Grade, Former Keeper
Busch Gardens, Tampa, FL

A Florida Sandhill Crane was recently hatched in our off-exhibit breeding area, known as the "Topi Pasture", and is doing well under the supervision of its parents.

This is the first crane chick we have been able to leave with its parents in a number of years. We have had to hand-raise our cranes in past years due to problems with exhibit competition and slow hatching. We have also pulled several eggs so that parents would lay again--we can hand-raise one clutch while they rear another, which yields twice the number of offspring.

Hand-rearing cranes is a lot of fun because they are natural-born comedians; but their playfulness also lends itself to difficulties with imprinting. Several years ago, we hand-raised two West African Crowned Cranes from our Monorail Display. When two individuals of the same species are raised together, the effects of imprinting are often lessened. This did not seem to be the case with these two birds, however, though they spent most of their time alone with each other. Once they discovered that humans in tan uniforms provided their food, they became imprinted to zoo staff.

Imprinted crane chicks are quite entertaining. The fears normally acquired from their natural parents are non-existent in a protected human environment, so their innate curiosity gets the best of them. They will poke, push, and prod at almost anything; tossing and tearing are also favorite pasttimes. I learned the hard way that the two West African Crowned Cranes were particularly fascinated with keys. I lost my keys four times before I discovered they were stealing them off the back of my truck to play catch!

Such innocent antics soon gave way to more serious problems, however. Our crane clowns grew fast and were soon constantly underfoot, tearing into food pans and garbage with zeal. But our greatest worry was how to introduce these "pets" to life on the veldt once they reached adulthood. Their uninhibited ways spelled "zebra bait" for sure--they were simply too aggressive and unafraid for their own good.

It was decided that a more aggressive attitude on the part of the keepers was needed to instill some common sense into these avian misfits; a little fear and distrust would go a long way toward survival of the birds in a hoofstock area. So keepers were instructed to holler at the birds, and to flail at them, and push them aside. Their own aggressiveness was unyielding, however, and they responded with behavior which clearly stated, "What fun!". Jumping up, pecking at us, and flailing back at us with their feet became quite a sport.

By the time these two birds were a year old, they were instigating these "games" with calculated accuracy of aim--their feet had developed cat-like claws with which they slashed away at every keeper within reach. We dubbed them "the Killer Cranes" at this point and approached them only with rake in hand to shield ourselves from their vicious attacks. They weren't pets anymore, but they weren't normal cranes either.

When the two birds were eventually moved into a hoofstock area, one of them decided to pick on one of its four-legged penmates...once. The other bird, however, is doing well with a group of crowned cranes in our Boat Ride exhibit and shows no signs of its former aggressiveness toward



keepers. Apparently, our strategy alienated the bird from humans enough to allow it to discover its own "cranehood" when housed with a number of like species.

The first crowned crane we hand-raised was never able to make this transition. It became so imprinted as a chick that, to this day, it has no idea it's a crane. As a juvenile, the bird was moved to a veldt area holding a number of crowned cranes, which sensed the behavior differences in the new arrival and pecked and pummeled it mercilessly. This crane now resides in the training center, where it relates all too well with its human trainers, often testing their patience with behavior just this side of obnoxious.

Our third attempt to hand-raise a crane was an East African Crowned Crane from a veldt exhibit. The father is confined in a pen, and the mother is the only remaining free-flight crane in the park. Her wandering ways made her a risk as a parent, so

this egg was also put in our incubator. The lone East African was raised with a chicken, limiting human contact to feeding and cleaning only. With the chicken for company, the bird did not seem to imprint to keepers as badly as the first three, and we thought we had a solution to our imprinting problems.

When the bird was old enough to be housed out-of-doors, it was moved to our off-exhibit holding and breeding facility known as "The Chicken Ranch", where it ignored the chickens and promptly attached itself to two Black Swan cygnets. Within minutes, this crane became hopelessly, permanently imprinted to the cygnets! The only cause for this seems to be the fact that the cygnets made crane-like noises at that age; upon meeting, the crane and the two cygnets struck up a veritable chorus of sueek-ourrs.

The cygnets were eventually sold, and the crowned crane was moved to a back area of the Chicken Ranch with a large number of waterfowl and several species of cranes. It got on well in the area, displaying no imprinting tendencies with either penmates or keepers. Early this year, however, we moved several Black Swans and cygnets into that area--the crane was overjoyed! It rushed up to the swans, noisily walking all over them as they rested in the sun, and began preening the cygnets. The swans seemed to take these overtures in stride, even reciprocating; but the cygnets were so bewildered by the blustery attempts at friendship from this agile, sharp-beaked bird that they sought refuge in the area pond, refusing to come out until the crane was moved.

A whole family of Black Swans, consisting of several adults and one crazy

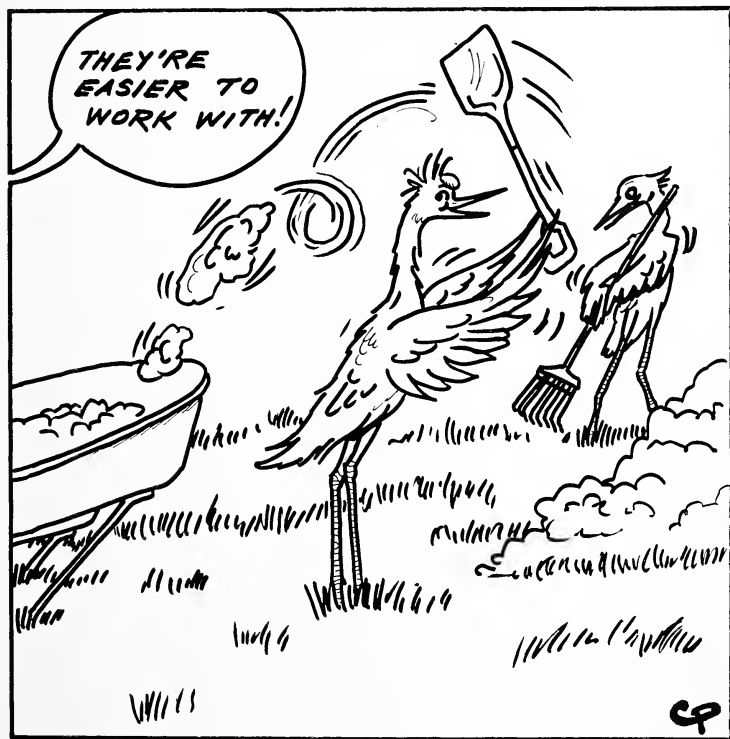
THOSE CRAZY CRANES, *Continued*

crane, now cooperatively resides in the area. It's amusing to watch the crane follow the swans into the pond for a swim--the swans float blissfully out to the deep water, while the crane tends to sink in the shallows. Not so amusing is the crane's behavior whenever we try to catch the swans. One peep out of them, and it harrasses the intruding keepers with beak and claws.

Late last year, an egg was pulled from a pair of Florida Sandhill Cranes in the "Topi Pasture". It hatched in our incubator and the chick was hand-raised. Its first few weeks were spent in a brooder with various peachicks. It didn't imprint to the peafowl but rather more often bullied them. In the wild, the older of two crane chicks often picks on the younger one, usually getting all the food in the process. This insures that at least one chick will survive if the food supply is short. So we were comfortable with the crane/peachick relationship as it seemed to mimic natural behaviors.

We were hoping, of course, to avoid imprinting the crane to humans. It was difficult to limit keeper contact with the crane, however, as it required minor medical treatments on a daily basis. Though we pestered the protesting chick with these treatments for several weeks, it became attached to its tormentors in preference to a relationship with any of the peachicks...another imprinted crane!

The chick was soon old enough to move to the "Chicken Ranch" where, like its predecessors, it spent a great deal of time underfoot. Tripping over the pint-sized bird was not as big a problem as running it over with our



Drawings by Cindi Pettit

THOSE CRAZY CRANES, *Continued*

truck, however. The bird came to associate all good things in life with that truck--keepers, food, things to play with--until it began running to greet the vehicle, chirp-purring and flapping its wings, oblivious to the squash power of the four big tires!

We tried various scare tactics to break this bad habit, which seemed to work well as the bird got older and expanded its interests. But one day, as I was counting birds in preparation for the night, I came up one short--that crazy crane was missing. Had I run it over? Did it slip out the gate? Was it drowned in a pool? No--it was sitting on the seat in the cab of the truck picking at the steering wheel!

Since we are not in the business of producing truck-driving cranes, we moved the bird to the back area with a variety of other birds, including an adult pair of Sandhills. It's relating well with the other cranes but still prefers keeper company. When we go into the area to feed, the bird initiates games of "catch" and "pounce". These games are natural behaviors, usually played with parents, as a learning tool. A young chick tosses sticks and stabs at them or dances around them as a way of learning food gathering and courtship techniques needed in adult life. The adult Sandhills at the Chicken Ranch will often join in the fun between the keepers and the chick, whose favorite game is "kill the escarole".

Not long ago, we began hand-raising a second Sandhill Crane chick. Unfortunately, this bird was imprinted from the time it took its very first breath. This egg was pulled because the chick was taking too long to pip and eventually had to be helped out of its shell. The little chick, worn out from trying to break out of the egg, was a slow starter. It had to be hand-fed at first, a job undertaken by our curator. The chick adored its new "Mom" and, shortly thereafter, became imprinted to the rest of us.

We kept this chick in a brooder by itself but moved it out-of-doors much sooner than any of the others. We were hoping some of the external stimuli and associations with other birds would help the chick to develop more outside of human influence and curb the tendency to imprint--hah! The bird was so hopelessly attached to the keepers that it paced its yard parallel to our activities all day long, trying to get to us through the wire. Its forehead would have been worn to the nubbins if we hadn't made it a miniature "helmet" out of masking tape.

As the chick grew, however, its attention did turn to other things. Its first batch was quite an event. The chick stood in one of our shallow stainless steel watering troughs, testing the water with timid beak splashes. Then it dipped its whole head under, just as both feet went out from under it!

There it sat, split-legged and soaked, looking absolutely betrayed. I rescued the chick from this humiliating predicament; but it was soon back at the trough, splashing and dipping with some ducklings.

This chick appeared to be developing well physically, as had all our hand-raised crane chicks. We had some problems initially with crooked toes, due to high protein content or improper calcium/phosphorus ratios in the diets, and lack of exercise; but these problems were solved by feeding a more omnivorous diet of proteins, grains, vegetables, and fruits and by moving the chick outside into large yards as soon as possible. It is interesting to note, though, that the Sandhill Crane chick which is presently being parent-reared is as large as this last hand-raised Sandhill, which is many weeks its senior. There are clearly physical, as well as behavioral benefits to leaving the hatchlings with their parents.

A number of breeders prefer hand-raised, imprinted birds because their tameness makes them easy to work with. The birds are not as disturbed by human intrusion during breeding and nesting activities and are much easier to manipulate; but imprinting can also ruin a bird for breeding. A bird which so closely identifies with humans will refuse to pair bond with a member of its own species without human intervention. And a crane which thinks it's a swan is a lost cause from any point of view!



One call does it all!

NEBRASKA BRAND



Quality Assured Diets
That Have
Constant Formulation
For
Balanced Nutrition
And
Economical Feeding

Frozen Feline Diets
(Horsemeat or Beef)

Frozen Bird of Prey Diets
(Fine or Coarse Grind)

Frozen Canine Diet

Chunk and Chopped Horsemeat,
Hearts, Livers, Rib, Shank and
Knuckle Bones

TOLL FREE

(800)

228-4005

In Nebraska, call collect
(402) 488-6492

Zu/Preem[®]

Feline Canned

Ratite Dry

Primate Canned

Omnivore Dry

Marmoset Canned

Primate Dry

Animal SPECTRUM Inc.

5801 Locust Street

Lincoln, Nebraska 68516



SPECTRUM

Banana Flavored Primate
(15% Protein)

Banana Flavored Primate
Pro-Plus
(25% Protein)

Omnivore Dry

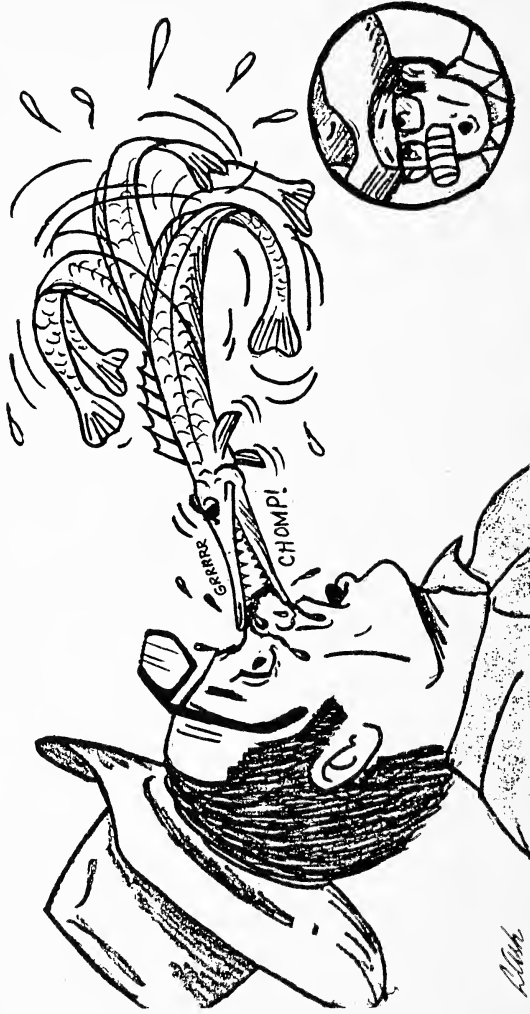
Polar Bear Dry

Canine Dry

Ratite Dry

Hoofstock Supplement
(with Selenium)

THINK Safety!



THINK SAFETY - ALL ZOO ANIMALS ARE POTENTIALLY DANGEROUS!

BREEDING THE COATI MUNDI
AT THE ATLANTA ZOO

By
Alan Sharples, Keeper
Atlanta Zoo, Atlanta, GA

The coati mundi (*Nasua nasua*) is a common animal in captivity. Although the Atlanta Zoo has had several specimens over the years, a breeding group was not established until after the acquisition of a male, Sydney, in August 1970, followed by a female, Tupe, in March 1971.

Since both of these animals were about six months to one year of age on arrival, and both were former pets, they were determined to be suitable for the Children's Zoo area. The pair was housed in the Children's Zoo barn in an indoor reserve cage which measured 4 X 1.5 X 2.5 meters. A small, sliding panel allowed access to an irregularly shaped outdoor exhibit cage, approximately 6 X 2.1 X 2.5 meters. Both cages are made of chain-link fence with a concrete floor. Since winters in Atlanta are mild, no heat was provided, although bedding straw was always available in the indoor reserve cage during the cooler months. The animals were quite indifferent to the cold, and were often seen outside in temperatures as low as -12°C.

Their diet consists of Nebraska Feline Diet, Science Diet (primate biscuit), apples, and carrots. Occasionally, freshly killed, day-old chicks are offered, one per animal.

A second male, Sebastian, arrived in February 1972, and it was this male that fathered the first litter. Mating was observed on 10 June, 1972, amid much chattering, and Tupe gave birth to a litter of five (5) young on 21 August, 1972, after a gestation period of seventy-one (71) days. Approximately two weeks before the birth, Tupe became very aggressive toward Sebastian, requiring his removal from their enclosure. The male remained separated from the others until after the offspring had been weaned and sold. This became the established procedure on all subsequent breedings.

A female from the first litter, Ginger, was retained as a mate for Sydney, our original male. Our plan was to establish two breeding pairs. However, Sebastian became increasingly quarrelsome with Tupe and he was sold. Sydney then became our sole breeding male.

During the summer of 1973, both females produced young, Tupe on 31 July and Ginger on 8 August. Ginger was one year old (352 days) at the birth of her first litter. With a previous gestation recorded at 71 days, Ginger was about 280 days old at the time of conception. Tupe produced two litters in 1974, on 12 July and 17 December. In 1975, Ginger did the same on 3 January and 9 July.

Another female offspring was retained for future breeding. This female, Mata Hari, was born on 26 May, 1976. She was mated with her father and gave birth on 18 June, 1977, at one year of age (388 days). No mating had been observed. The number of young could not be recorded, as the other adult females killed and ate the infants for unknown reasons. A second litter, on 6 July, 1978, was also killed and eaten, so Mata Hari was sent to the Santa Fe Teaching Zoo, Gainesville, FL on 27 July, 1978.

BREEDING THE COATI MUNDI AT THE ATLANTA ZOO, *Continued*

Mating occurred on 19, 20 and 21 April in 1981. On 29 June, 1981, Tupe bore three offspring (1.2), all of which are still housed at the Atlanta Zoo. To date, this has been Tupe's last litter. At the time of Tupe's last litter, she was at least 10 years, 3 months old.

On 21 May, 1981, the breeding male, Sydney, died. As a result, Ralph, the last male offspring, became the breeding male. Ralph showed no apparent interest in either Tupe or Ginger, but did mate with Roxanne, one of his female litter mates. Five (5) young were born on 19 June, 1983. Ginger immediately killed and ate one infant. Fortunately, several keepers were present and Roxanne and the four surviving infants were removed to the Children's Zoo.

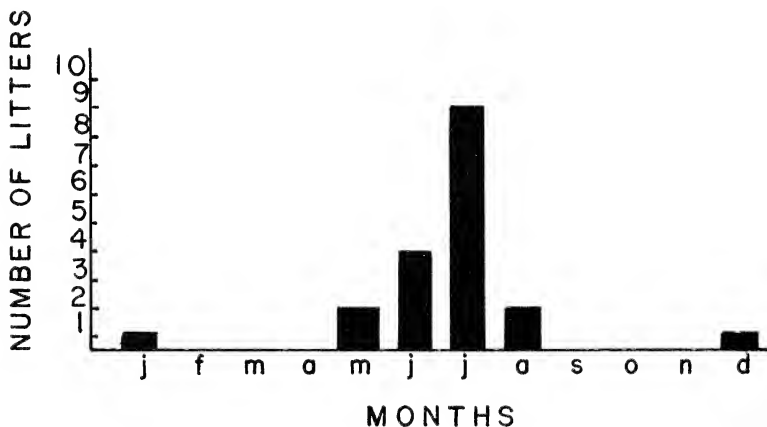
One theory put forward concerning this incident of infanticide is the close blood ties shared by all of the adult females. This may also explain the killing of both of Mata Hari's litters five years earlier.

Since 1972, a total of 19 litters have been produced, with 108 young surviving. Litter sizes have ranged from one (1) to eight (8) with the average being five (5).

Products mentioned in the text:

Nebraska Feline Diet, Central Packing, Division of Allied Mills, Inc.
North Platt, NE 69101
Science Diet, Riviana Foods, Inc., Hill's Division, Topeka, KS 66601

Birth Frequency Distribution In Which 19 Litters
Occurred Over An 11-Year Period
(From August 1972 to June 1983)



Legislative News

Compiled by Kevin Conway
Legislative Coordinator

UTAH PRAIRIE DOG PROPOSED FOR RECLASSIFICATION

The Utah prairie dog (*Cynomys parvidens*) has been proposed by the USFWS for reclassification from Endangered to Threatened. Although this rodent still only occupies a small part of its historical range, its overall numbers have increased since 1972. Two populations are now straining the carrying capacity of the available habitat, making them vulnerable to disease; in addition, conflicts with human agricultural interests are growing. To help prevent disease and illegal killings by area landowners, the proposal includes a special rule that would allow for the regulated take of up to 5,000 individuals annually under permit and in accordance with specific restrictions.

The species is a burrowing rodent in the squirrel (*Sciuridae*) family that occurs only in southern Utah. Its numbers have fallen from an estimated 95,000 individuals in the 1920's to a 1982 spring estimate of about 10,000 adults. The species has also experienced a corresponding loss of range. This population decline was caused by disease, habitat alteration, and poisoning because the prairie dog was considered a competitor with livestock for forage. In 1973, the Utah prairie dog was listed as an Endangered species. On 5 November, 1979, the Utah Division of Wildlife Resources petitioned the USFWS to remove the prairie dog from the U.S. List of Endangered and Threatened Species.

Today, the Utah prairie dog is no longer considered in danger of extinction, although the Service does not feel that the available data show it has recovered to the point where it can safely be removed from the list altogether. The population estimate of adult animals in the Cedar and Parowan Valleys is eastern Iron County increased significantly from 1976 (1,200) to spring 1982 (7,300). It should be noted that early spring censuses include only those adults that have survived the winter. In the summer after the young are born and become active, but before the fall/winter mortality, the numbers are much higher. This is the time when it is necessary to reduce population pressures in the Cedar and Parowan Valleys; the summer numbers in these valleys are probably in excess of 20,000 prairie dogs.

Such large numbers of juveniles strain the carrying capacity of the habitat, and increase the danger of sylvatic plague. There is also a serious conflict in these valleys with agriculture. In the Cedar and Parowan Valleys alone, 98 percent of all prairie dogs are on private land upon which the major crop is alfalfa, a preferred prairie dog food. Crop losses have become extensive where large prairie dog towns have developed, the mounds damage haying equipment, and the burrows drain irrigated fields. Since the species was given protection, its numbers have increased in some areas to the point that local farmers and ranchers might be tempted to return to such traditional, but now illegal, means as poisoning for relief. Uncontrolled measures like these could again reduce the species' population to an Endangered status.

In an effort to relieve the local overpopulation problems, the Utah Division of Wildlife Resources removed 2,437 animals from the Cedar and Parowan Valleys between 1976-80 for relocation onto public lands. Although many of these animal apparently did not survive, the number of known prairie dog towns on private lands increased from 40 in 1976 to 57 in 1982; about 38% of all Utah prairie dog towns in 1982 throughout the species' total

LEGISLATIVE NEWS, Continued

current range occur on public land. The State will continue to live-trap prairie dogs on private lands and relocate them to Federal lands, but it has become apparent that the relocation program is not able to keep up with the species growing population in the Cedar and Parowan Valleys, and that new sites for reintroduction are limited. Accordingly, the proposed reclassification of the Utah prairie dog to Threatened contains a special rule that would permit the State to authorize certain individuals to legally take up to 5,000 animals annually between 1 June and 31 December in delineated portions of the Cedar and Parowan Valleys. Such taking would not be permitted by means of chemical toxicants.

The Service does not believe that the proposed control program would jeopardize the survival of the species in these valleys. Numbers of animals actually taken, their location, and the methods used would have to be reported to the Service at 90-day intervals. Further, the State will continue its annual Utah prairie dog census and will submit these data to the Service each year. The Service would reserve the right to immediately halt any taking if it receives substantial information that the survival of the populations in the effected areas is being jeopardized.

---Endangered Species Technical Bulletin
Vol. VII, No. 6

USFWS RECLASSIFIES ARCTIC PEREGRINE

U.S. Fish and Wildlife Service has reclassified the Arctic peregrine falcon from Endangered to Threatened. Listed as Endangered in 1970, the peregrine has been increasing in numbers as the levels of DDT and its metabolites have been decreasing. The Arctic birds, one of three subspecies of peregrine in North America, nests in Alaska, Canada and Greenland and winters from the southern U.S. through all of Central and South America.

---ECOLOGY USA
August 1, 1983

BEAVER IMPACT ON AQUATIC AND FOREST ECOLOGY PROFOUND, WOODS HOLE REPORTS

Although the North American beaver is known for its impact on stream ecosystems and surrounding landscapes, *Castor canadensis* play a much more important and intricate role in aquatic and forest ecology that has been previously known, Robert Naiman of Woods Hole Oceanographic Institution recently reported. With the aid of a National Science Foundation grant, Naiman studied how the aquatic animals changed the physical, chemical, ecological, topographical and population characteristics of areas where they settled and the effects of the changes.

Naiman and his researchers found that as beavers dam water channels, effectively slowing the flow of water, soil erosion diminishes. Nutrients in the water, such as nitrogen, phosphorus and carbon, are slowly released below the dam, increasing the quantity and enhancing the quality of aquatic life in the stream below. The researchers also found that as beavers carry nitrogen-rich woods such as willow, alder and birch into their ponds as food and building material, the nitrogen enriches the pond water, attracting additional species of vertebrates and invertebrates.

By cutting down trees and opening the forest canopy so more sunlight reaches the ground, beavers can cause changes in soil composition and tem-

perature. As a result, types of bacteria and other microorganisms that had not been there before, form communities in the soil. By damming streams, beavers significantly increase the volume of water in the water-course and mitigate the impact of periods of drought on the surrounding countryside. Finally, beavers have caused many indirect effects on human activity and population settlements that have been significant and long-lasting.

Although little had been known of the beaver's prehistoric role, recent studies of eroding valley floors have uncovered ancient beaver dams that many scientists now believe created some of the extensive prairies and wetlands in the U.S. The topographical succession begins with a stream or narrow river. Beavers arrive, build a dam, create a pond, and dig canals. As silt begins to plug the slightly porous dams, the ponds spread and often create shallow freshwater meadows. Decades later, the dams, now heavily silted, may divert the stream, and the freshwater meadow is left to become a prairie or young forest.

While their tree-felling may be regarded as an esthetic debit, forest ecologists note that beavers are no threat to the forests since the trees they cut are replaced by other fast-growing species such as pine, fir and spruces.

According to Naiman, the findings to date indicate that the beaver populations, once drastically reduced, is now increasing. Extensive hunting of beavers both for food and fur had led to their near extinction in the U.S. in the early 1900's. In the 1600's there were an estimated 60 to 400 million beavers in North America. Today there are about one-tenth that number. Since 1900, the spread of developed areas had reduced the number of beaver predators such as wolves, coyotes, bears, foxes and otters. Trapping quotas and hunting restrictions and the manufacture of imitation furs that lowered the price of beaver pelts (pelts that sold for \$75 in 1900 now sell for \$5.00) have also helped keep the beaver from being wiped out.

---ECOLOGY USA
July 4, 1983

EXPERIMENTAL PERMITS SOUGHT FOR COYOTE PESTICIDE

Despite a ten-year-old ban on the coyote pesticide Compound 1080, Environmental Protection Agency is considering several requests to permit renewed use of the substance. The applicants are seeking the exemptions in order to determine poisoning hazards for certain non-target wildlife species when the compound is used as a predacide to control coyotes. Compound 1080 became controversial because many non-target species were being poisoned.

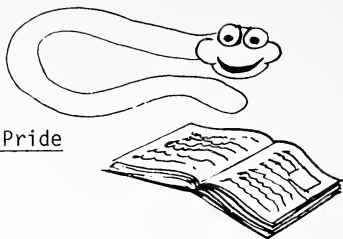
An application from the University of California, Davis, requests the experimental permit to test a new bait technique called bait delivery unit. The application proposes to use 0.01 pounds of the compound on 400 acres of livestock range in California. Texas A&M University's application, also directed to coyotes, proposes to use 10 grams of 1080 on 10,000 acres.

The Fish and Wildlife Service wants to use 0.05 pounds in single lethal dose baits on 256,000 acres in Idaho and Montana. Also, the service wants to use remaining supplies of 800 toxic collars (containing 299 grams) on sheep and goats to control coyotes in four states. U.S. Department of Agriculture has proposed using 0.0009 pounds of 1080 in grain bait for prairie dogs.

---ECOLOGY USA
September 26, 1983



Book Review



LIONS SHARE: The Story of a Serengeti Pride

By Jeannette Hanby
Illustrated by David Bygott
Houghton Mifflin
Two Park Street, Boston, MA 02108
Hardcover Price: \$16.95

*Review by Susan Chan
Managing Editor, AKF*

Never have I felt so much a part of the landscape of a literary work than I did while reading Lions Share. Both author and illustrator--a husband and wife team--have pooled their individual talents to make the often hostile existence of life on the Serengeti come alive for the reader. One can almost feel the heat, the incessant buzzing of insects and even the long-awaited soaking rains. As reviewer Ernest Neal noted in his review, the book is "a work of art, a true synthesis between splendid descriptive prose and brilliantly evocative pictures."

The book follows the struggle of nine young female lions to establish a territory on the short grass plains of the Serengeti. Hanby and Bygott spent four and a half years following this group, recording in detail their fortunes--the group's first encounter with nomadic males, the first breedings of the young females and the birth of their cubs. The author and illustrator have both captured the intense bonds evolved between the pride members--bonds which are a necessity for survival. While the book does contain some wonderful color photographs, it is the beautifully detailed drawings which really enhance and expand the meaning and atmosphere of the text.

Hanby and Bygott studied lions under the auspices of the Serengeti Research Institute in Tanzania and both these eminently qualified field biologists have put together a book about the life style and life cycle of a wild lion pride that can be enjoyed by professional and amateur zoologist alike. As a reader, I found myself becoming emotionally involved in the fate of the Sametu pride as their fates ebbed and flowed with the changing seasons.

Besides presenting a wealth of knowledge and insight, both old and new, into the life of this lion pride, Hanby and Bygott have also painted a verbal and visual story of the entire ecosystem of the Serengeti plains--the hyena and jackal playing out the role of scavenger, the cheetah conducting its masterful stalk of a zebra, a protective rhino mother defending her youngster and the wildebeest migration filling the grasslands with a teeming mass of determination and tradition.

If you want to not only read a book which will expand your knowledge of lions, but also read one which will delight your senses, then Lions Share should be on your "must buy" list. I don't think you'll be disappointed.



THE COLLEGE OF AFRICAN WILDLIFE MANAGEMENT

By
Jan Richards, Keeper
Auckland Zoo, Auckland, New Zealand

Earlier this year I spent seven weeks in Tanzania visiting relatives and Game Parks. While in Tanzania, I also had the good fortune to visit the College of African Wildlife Management at Mweka. This visit was made possible through my uncle and coincided with the College's 20th Anniversary and their launching of a nationwide "Save the Rhino" campaign.

Before going into more detail about the College itself, I feel I should explain exactly how the visit was made possible. Prior to emigrating to Canada, my uncle spent over 30 years in Tanzania working for the government and in the early 1960's he, and a number of others were responsible for getting the College established. Now, in his role as Canadian High Commissioner to Tanzania, he has helped channel aid into the College. Consequently, he was invited to the celebrations as well as any guests he wished to accompany he and my aunt.

The College itself is north of Moshi and lies at an elevation of 1400m on the south slope of Mt. Kilimanjaro. The campus covers an area of 21 hectares and prior to becoming the Wildlife College in 1963, the existing buildings had been empty since being vacated by nurses in 1958. This particular location has numerous advantages. It is close to many parks, reserves and game control areas. These include the savannah grasslands of the Serengeti, the plateau area of the Ngorongoro highlands, the forests and alpine moorlands of Kilimanjaro and Mero, the alkaline lakes of the Rift Valley and the marine resources of the Indian Ocean.

The basic objective of the courses offered at Mweka is to train personnel in supervising and implementing management activities in various types of conservation areas. The courses can be basically put into four groups: (1) Certificate course: For '0' level entry students. A 2-year course. Graduates are of Assistant Game Warden level. (2) Diploma course: For 'A' level entry students. A 2-year course to position of Game Warden or other senior field position. (3) Post-graduate Diploma: For University graduates who wish further practical training. A One-year course involving a specific research project. (4) Special course: Based on specific request from an agency, e.g. World Wildlife Fund, and lasts from 6-12 months on a special topic.

Apart from a good command of English and scientific subjects, the incoming student must have already had some practical field experience. The subjects covered come under three areas:

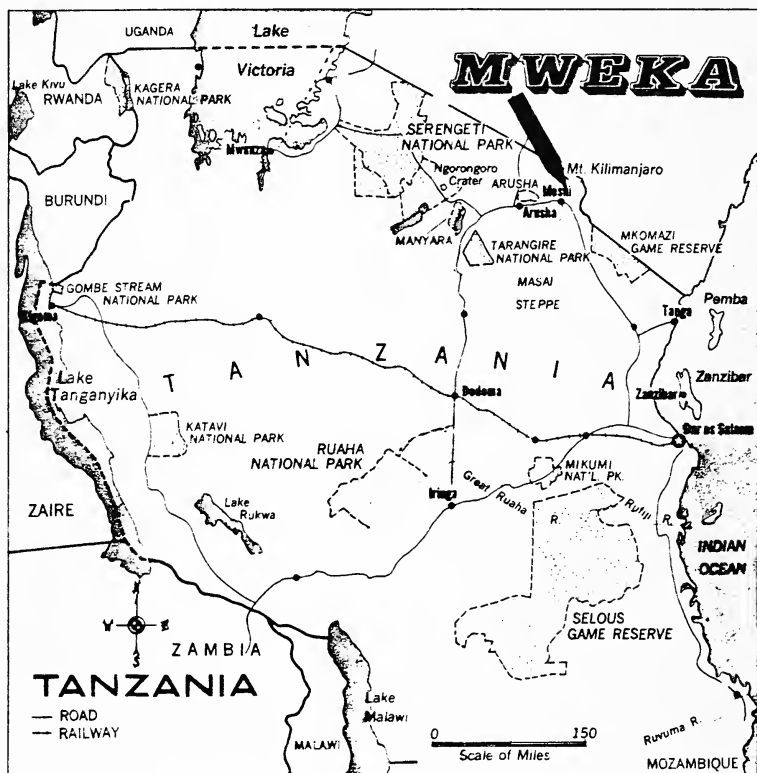
1. Natural Sciences, e.g. mammalogy, ornithology, botany
2. Wildlife Management, e.g. inventory, surveying, photography, range management, vehicle maintenance, ballistics, statistics.
3. Estate Management and Conservation Education, e.g. administration, construction, law, first aid, survival techniques.

Since the College's inception 20 years ago, 958 students have graduated from a total of 16 countries. Those countries are: Tanzania, Kenya, Zambia, Ghana, Uganda, Nigeria, Ethiopia, Sudan, Botswana, Malawi, Liberia, Sierra Leone, Cameroun, Somalia, Egypt and the United Kingdom.

THE COLLEGE OF AFRICAN WILDLIFE MANAGEMENT, Continued

All the students tend to be sponsored by governments and other organizations and the fees are \$6,000.00 (U.S.) per year including board and lodging.

As I mentioned earlier, aid is channeled into the college from governments such as Canada. Despite the fact that the college comes under the umbrella of the Ministry of Natural Resources and Tourism, they do not have the financial reserves to run such an operation on their own. Some of those involved are the U.S. Parks Service, I.U.C.N., New York and Frankfurt Zoological Societies, West German and British Governments and perhaps the biggest contributor of all, The Danish International Development Agency (DANIDA). The aid covers everything from equipment and tutors to monetary grants.



In closing I would like to say that despite the chronic problems of poaching, Tanzania does at least have a President dedicated to wildlife preservation and this was highlighted as far back as 1961 with the signing of the Arusha Manifesto. Part of this document states that "The survival of our wildlife is a matter of grave concern to all of us in Africa. These wild creatures amid the wild places they inhabit are an integral part of our natural resources and of our future livelihood and well-being. In accepting the trusteeship of our wildlife, we solemnly declare that we will do everything in our power to make sure that our children's grandchildren will be able to enjoy this rich and precious inheritance."

Finally, and on a personal note, I would just like to say that having met President Nyerere and some other officials, they are genuinely dedicated to wildlife preservation.



RIVERBANKS AAZK CHAPTER TO SPONSOR SOUTHEASTERN REGIONAL

WHEN: April 19, 20 & 21, 1984

WHERE: Riverbanks Zoological Park, Columbia, SC



SECOND CALL FOR PAPERS: Papers are requested for this regional conference. Each paper will be limited to 20 minutes with a five minute question and answer period. Topics should pertain to zoos and zookeeping. Abstracts or outlines should be submitted by 15 February 1984. The conference registration fee will be reduced for those people presenting papers.

The conference registration fee is \$25.00 per member and \$30.00 for non-members. Day rates for conference activities will be available.

TENTATIVE CONFERENCE SCHEDULE

Thursday, April 19

Registration
Ice Breaker

Friday, April 20

Announcements/Welcome
Tours of Riverbanks Zoo
Presentation of Papers
Workshop/Discussion

Saturday, April 21

Presentation/Papers
Guest Speakers
Chicken Bar-B-Que

All conference events will be held on the Riverbanks Zoo grounds. Look for hotel and accomodation information in the December issue of Animal Keepers' Forum.

Please return the completed registration form and fee to: Stephen Danko, Conference Coordinator, Riverbanks Zoo Chapter AAZK, 500 Wildlife Parkway, Columbia, SC 29210. Please make checks payable to: "RIVERBANKS ZOO CHAPTER AAZK".

REGISTRATION FORM

NAME: _____

FEES

ADDRESS: _____

Member or spouse - \$25.00

CITY: _____

Non-member - \$30.00

STATE: _____ ZIP CODE: _____

Late registration fee - \$5.00
(after March 1, 1984)

PHONE NO.: () _____

Number attending conference/BBQ: _____

Total fees enclosed \$ _____

Area of interest: _____

Vegetarian: _____ YES _____ NO

Transportation: _____

NATIONAL WILDLIFE REHABILITATION ASSOCIATION OFFERS GRANTS

The Honors, Awards and Grants Committee of The National Wildlife Rehabilitation Association would like to announce the initiation of a small grants program. We expect \$1,000.00 to be available beginning 1 July, 1984 which could be used to support a single \$1,000.00 project or several smaller projects which add up to \$1,000.00, depending on the qualifications of the applicant. Funds will be available for a project in the field of wildlife rehabilitation only, applicants must demonstrate financial need, and applicants must submit a typewritten proposal which includes name(s) and resumé of personnel involved, objective of the project, a brief statement of literature review, a brief description of how the work will be carried out, and an itemized budget. An annual report on progress will be required.

The Committee has also established three awards as follows:

Lifetime Achievement Award - This would go to an individual whose primary identification is that of a wildlife rehabilitator who has contributed to the field in a major way for many years. The awardee will receive a plaque, \$100.00 and free conference registration. The award will be presented at the NWRA conference.

Significant Achievement Award - This would go to a person who has contributed something of significant merit to the field of wildlife rehabilitation within the last 2 years. Contribution can be a research finding, publication, organization of a program, etc., as long as the major theme is that of wildlife rehabilitation. The awardee would receive the same benefits as for the Lifetime Achievement Award.

Keynote Award - This award would pay travel and lodging expenses for one keynote speaker for each annual conference of the NWRA. The speaker would be selected by the host committee for the annual conference.

Suggestions of individuals who might be appropriate awardees and proposals for grants should be submitted to:

Dr. G.E. Duke
Department of Veterinary Biology
College of Veterinary Medicine
295 Animal Science/Veterinary Medicine Bldg.
1988 Fitch Avenue
St. Paul, Minnesota 55108



Keeper's Alert

ATTENTION: TV WORTH WATCHING!!! If you have not as yet had the opportunity to catch the second season of Marty Stouffer's "Wild America" series on your local PBS station, you're missing out! Last year's premiere season of the series was highly lauded and so successful, that it begins it's second season this Fall. Scheduled programs include: "Antlered Kingdom", "Wild Wings", "Wild Cats", "The Man Who Loved Bears" and "Backyard Wildlife". Be sure and check your local PBS listings for time and dates in your area.

HUSBANDRY HINTS

FLY REPELLENT FROM THE SPICE RACK

By
Ted Daehnke, Animal Keeper
Sacramento Zoo, Sacramento, CA

For the last three years, we have been adding garlic to our antelope and gazelle feed. This is done in an effort to reduce the long-standing problem with flies. The most obvious symptom of our fly problem occurred with the Eland. Every summer they developed black tracks below their eyes due to drainage caused by fly irritation. Although we could use 'Wipe' and other repellents on the animals' legs and bodies, we could not use these chemicals around the eyes and mouth.

Garlic in the diet has proven very effective in controlling flies in this area. Garlic powder is sprinkled over the food every day during the fly season. It is important that the treatment be consistent. At the beginning of each season it seems to take four or five days for the garlic to build up in the animals' system to the point that it is effective and a lapse of two to three days seems to clear the animals' system.

The first year we used garlic, the treatment did not begin until mid-summer. Within two weeks the Eland's eye problems had cleared up and their faces appeared relatively free of flies. The second summer treatment began as soon as we detected drainage from the Eland's eyes and again the results were almost immediate. This last summer, we began adding garlic before the fly season and the only drainage that occurred developed in an individual that was temporarily taken off feed for veterinary reasons.

Garlic has not replaced the use of 'Wipe' for controlling flies on our hoofstock. It is used as a supplement and is only effective on areas of the animals' body where the garlic will be excreted with normal metabolic products. Fortunately, in our case, these areas correspond with the areas most difficult to treat by our normal procedures. We were introduced to this treatment by Pat Sammarco of Lincoln Park Zoo who was using it on a bear string. It would probably be of some use with any group of animals which would accept it as part of their diet.



Information Please

We've recently acquired 5.3 pygmy marmosets and have had twins born to two females within the last few months. We would appreciate any information regarding general husbandry and housing with particular emphasis on gestation, diet, exhibit temperature and humidity ranges, and group dynamics. Please contact keepers Donna Gutekunst or Mary Willis, c/o Primate Propagation Center, P.O. Box 551, San Diego Zoo, San Diego, CA 92112.

PALM CIVET INFO REQUESTED --Information is being sought for the writing of a research paper on the behavior, reproduction and physiology of Paguma larvata. Any Zoos and/or individuals having experience with this species either in captivity or in the wild are asked to correspond. Sources of information will be appreciated and acknowledged. Contact Kathleen Schneider, 15270 Westover Road, Elm Grove, WI 53122/(414) 786-8609.



Gorilla Bibliography

Contains over 1,000 listings. Includes articles on behavior, development, nutrition, hand-rearing, disease, reproduction, laboratory data, vocalizations, social structure, captive and wild habitat, as well as articles of general information and interest.

GORILLA BIBLIOGRAPHY is available from: Seattle Zoological Society, 5500 Phinney Avenue North, Seattle, WA 98103. (206) 782-9455.

Cost: \$10.00 (U.S. Funds)
Postage/Handling: \$.63
Overseas: \$.83

Make checks payable to:
Seattle Zoological Society.

All proceeds will go toward habitat improvement at Woodland Park Zoological Gardens.

Publications Available

The following books are for sale from Michael Dee, 524 Irving Ave., Glendale, CA 91201. Prices are firm. Additional titles available and may be obtained by writing to Mike. These are single copies only.

Bere, Rennie The African Elephant \$8.00
1966, 96 pp., B&W & Color photos

Dixon, A.F. The Natural History of the Gorilla \$16.00
1981, 202 pp., B&W photos

Harrison, John An Introduction to Mammals of Singapore and Malaya \$10.00
340 pp., illustrations

Harrison, Colin A Field Guide to the Nests, Eggs and Nestlings of North American Birds \$8.00
1978, 416 pp., color plates and B&W drawings

Coimbra-Filho, A. & Mittermeier, R. Ecology and Behavior of Neotropical Primates \$25.00
Volume I, 1981, 496 pp., B&W photos

Valdez, Raul The Wild Sheep of the World \$35.00
1982, 186 pp., B&W and color photos



U.S. POSTAL SERVICE
STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(requirement of Section 448.31 Domestic Mail Manual)

Title of Publication: *Animal Keepers' Forum*

Publication Number: 01649531

Date of Filing: 27 September 1983

Frequency of Issue: Monthly. Number of issues published annually = 12.

Annual Subscription Price = \$20.00.

Location of Known Office of Publication: Topeka Zoological Park, 635 Gage Blvd., Topeka, KS 66606.

Publisher: American Association of Zoo Keepers, Inc., Topeka Zoological Park, 635 Gage Blvd., Topeka, KS 66606.

Executive Editor: Michael D. Coker, 635 Gage Blvd., Topeka, KS 66606.

Managing Editor: Susan D. Chan, 635 Gage Blvd., Topeka, KS 66606.

Owner: American Association of Zoo Keepers, Inc., Topeka Zoological Park, 635 Gage Blvd., Topeka, KS 66606.

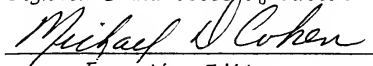
The purpose, function, and nonprofit status of this organization and the exempt status for Federal Income Tax purposes have not changed during the preceding 12 months.

EXTENT AND NATURE OF CIRCULATION

	Average No. Copies Each Issue during Preceding 12 months	Actual No. Copies of Single Issue Published nearest to Filing Date
Total Number Copies Printed	1772	1835
Mail Subscriptions	1668	1747
Copies not Distributed (Office use, left-over)	32	24
TOTAL	1772	1835

*I certify that the statements made
by me above are correct and complete.*

Signature and title of Editor


Executive Editor



CHAPTER NEWS

Newly elected officers of the San Diego Zoo Chapter of AAZK are:

President.....Conny Carson
Secretary.....Jody Courtney

Vice President.....Debbie Hewitt
Treasurer.....Heidi Ensley

AAZK Accessories Available

Pins And Charms: Enameled three-quarter inch pins and charms with the official AAZK logo are now available. They are done in the same colors as the AAZK Patch and the charms are suitable for necklaces (you provide the chain). The price per pin or charm is \$3.50 which includes postage. To order send your name, complete mailing address, number of pins or charms desired to: AAZK National, 635 Gage Blvd., Topeka, Ks 66606. Make check or money order payable to AAZK National.

Buttons: For a "Keepers Care" Button, send the coupon and 50¢ to: Larry Sammarco, Lincoln Park Zoo, 2200 N. Cannon Drive, Chicago, IL 60614.



Decals: The official AAZK decal is available through the Memphis Zoo Chapter. The decal is a black and white reproduction of the AAZK rhino logo, suitable for any smooth, hard surface, especially a car window. Cost is \$1.50 complete, prepaid. Make checks payable to the Memphis Chapter, AAZK and send directly to Mike Maybry, Decal Project Coordinator, 1887 Crump Ave., Memphis, TN 38107.

AAZK T-shirts with the official emblem are now available from the Phoenix Chapter. The price is \$6.75 including postage and handling. Sizes Small, Medium, Large, and Extra-Large are available in two colors: Tan with dark brown logo and Dark Brown with white logo. To order, complete coupon below or copy information and send with check or money order to: Mike Carpenter, 906 N. Hayden, #3, Scottsdale, AZ 85257. Make checks payable to "Phoenix AAZK Chapter". Shirts will be returned by 1st Class mail.

AAZK T-Shirt Order Form

Please send _____ T-shirts at \$6.75 each. COLOR: TAN _____ BROWN _____

SIZE: _____ Small _____ Medium _____ Large _____ Extra-Large

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

LIMITED EDITION

SPECIAL COMMEMORATIVE AKF TENTH ANNIVERSARY T-SHIRT

ANIMAL KEEPERS' FORUM



Dedicated to Professional Animal Care

TENTH ANNIVERSARY

1974 - 1984

AKF will be ten years old in October 1984. To commemorate ten years of continuous publication, a special T-shirt is being issued.

The Puget Sound AAZK Chapter has taken this on as a fund-raising project for the 1984 AAZK Conference. All profits will benefit the Conference and AKF.

The T-shirts will only be available from October 1983 through October 1984. A check must accompany your order. Please allow 3-4 weeks for delivery. The price of \$7.50 each includes postage and handling. The shirts are 100% cotton; if you wash or dry at high temperatures, order a size larger.

AKF COMMEMORATIVE T-SHIRT ORDER FORM

NAME: _____

ADDRESS: _____

Color choice: ☐ powder blue ☐ beige

Size: ☐ Small ☐ Medium ☐ Large ☐ Extra Large

Make checks payable to: The Puget Sound AAZK Chapter Conference Account
Mail to: Woodland Park Zoological Gardens, 5500 Phinney Ave., N., Seattle,
WA 98103.

TOTAL AMOUNT ENCLOSED \$ _____

We are indebted to the AAZPA Newsletter for allowing us to reprint portions of this section from their "Positions Available" listing. This is a monthly service to us, for you.

ELEPHANT KEEPER...requires year paid experience in the care and handling of a variety of animals and six months' experience in a zoological institution; or have a BS in biology/zoology/animal science/veterinary technology. Driver's license required. Salary \$12,714-\$13,712. Contact Sandra Kempske, Curator/Mammals, Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217.

AQUARIUM KEEPER...responsible for care of fish, invertebrates and supporting equipment. Experience and degree in zoology/related field desirable. Salary \$10,908-\$15,312, benefits. Send resume to Russell Smith, General Curator, San Antonio Zoological Gardens and Aquarium, 3903 N. St. Mary's St., San Antonio, TX 78121.

ASSISTANT MAMMAL CURATOR...requires background in bio. sci. and 3 years' supervisory experience. Salary \$22,284. Send vitae to L.E. Fisher, DVM, Lincoln Park Zoo, 2200 N. Cannon Dr., Chicago, IL 60614.

SUPERVISOR/PRIMATES...to supervise primate department, specializing in lemurs/guenons. Plans and oversees exhibits, assists in breeding/research projects and with acquisition/disposition. Supervisory and primate experience required. Prefer zoological or related field degree, experience may substitute. Send resume to Jacob P. Yelverton, Zoo Director, Louisiana Purchase Gardens & Zoo, P.O. Box 123, Monroe, LA 71201.

PRIMATE KEEPER...responsible for daily feeding, maintenance, health and behavior observations of monkeys and apes. Requires two years' experience as primate keeper; degree in zoology or related field desirable. Salary \$11,500-\$12,000. Contact Sam Winslow, Curator of Mammals, Audubon Park Zoological Gardens, P.O. Box 4327, New Orleans, LA 70178, (504) 861-2537.

CURATOR...requires 3 years' supervisory experience plus orientation toward education programs and BS degree. Responsible for animal management, education department and volunteer program. Salary \$19,600 plus benefits. Submit resume to Richard Ryan, Director, Turtle Back Zoo, 560 Northfield Ave., West Orange, NJ 07052.

CURATOR...responsible for planning/implementing education program, coordinating/training docents; serves as acting zoo director; BS in education or science, teaching experience and master's degree preferred. Requires supervisory, writing and public speaking skills. Salary \$15,084, starting date 1 January 1984. Contact Mark Rich, Director, Mesker Park Zoo, Bement Avenue, Evansville, IN 47712.

CURATOR...responsible for administration, program development and exhibits. Requires BS in biology, chemistry or oceanography and MS in museum science or education; experience in museum programs, writing and field collecting. Aquarium practice and scuba preferred. Salary \$23,112-\$27,864. Apply by 30 Nov. to Scripps Institute of Oceanography, University of California San Diego SPMO (8441-W) Q-016, La Jolla, CA 92093.

ASSISTANT MANAGER/CHILDREN'S VILLAGE...responsible for daily care of collection, maintenance of facilities and supervision, of staff/volunteers. Requires 2 years' zoo experience. Management experience and degree in zoology or related field desirable. Salary \$13,260, plus benefits. Contact David Anderson, General Curator, Audubon Zoological Gardens, P.O. BOX 4327, New Orleans, LA 70178 (504) 861-2537.

o
p
p
o
r
t
u
n
i
t
y
k
n
o
c
k
s

AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

*Articles printed do not necessarily reflect the
opinions of the Animal Keepers' Forum editorial
staff or of the American Association of Zoo Keepers.*

Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Jeuneur Cross
Postage Paid At Topeka



NATIONAL ZOO LIBRARY
NATIONAL ZOOLOGICAL PARK
WASHINGTON, D.C. 20008

INST

SPECIAL EDITION

Animal Keepers' Forum

Smithsonian Institution Libraries



A.A.Z.K.

NATIONAL CONFERENCE

1983

Dedicated to Professional Animal Care

DECEMBER 1983



Executive Editor: Mike Coker
 Managing Editor: Susan Chan
 Associate Editor: Alice Miser
 Associate Editor: Bernie Feldman

DECEMBER 1983
 VOLUME TEN
 NUMBER TWELVE

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publishing costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

AMERICAN ASSOCIATION OF ZOO KEEPERS, INC.
 NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
 Dolly Clark, Administrative Secretary

BOARD OF DIRECTORS

Kevin Conway, NZP/Conservation & Research Center Front Royal, VA 22630	President
Jean Hromadka, San Diego Wild Animal Park Escondido, CA 92025	Vice President
Pat Sammarco, Lincoln Park Zoo, Chicago, IL 60614	
Mike Carpenter, Phoenix Zoo, Phoenix, AZ 85010	
Verona Barr, Miller Park Zoo, Bloomington, IL 61701	

COMMITTEE CHAIRMEN

<u>Coordinator for Chapter Affairs</u> <u>Patti Kuntzmann, Lincoln Park</u> <u>Continuing Keeper Education</u> <u>Judie Steenberg, Woodland Park</u> <u>Historical Committee</u> <u>Larry Sammarco, Lincoln Park</u> <u>Professional Standards Committee</u> <u>Kevin Conway, NZP/CRC, Front Royal</u>	<u>Coordinator for International Affairs</u> <u>Randy Adolph, St. Louis Zoo</u> <u>Research/Grants Committee</u> <u>Frank Kohn, National Zoological Park</u> <u>Awards Committee</u> <u>Mike Crocker, Dickerson Park Zoo</u> <u>Legislative Action Committee</u> <u>Kevin Conway, NZP/CRC, Front Royal</u>
---	---

PROJECT HEADS

<u>Staff Exchange</u> <u>Elandra Aum, Woodland Park</u> <u>Animal Data Transfer Forms</u> <u>Bernie Feldman, Topeka Zoo</u> <u>Program Library</u> <u>Mike Crocker, Dickerson Park</u> <u>Infant Development</u> <u>Steve Taylor, Louisville</u> <u>Keeper Accomodations List</u> <u>Oliver Claffey, Metro Toronto</u>	<u>Library Resource/Book Review</u> <u>Ellen Leach, Woodland Park</u> <u>Biological Values Booklet/Gestation</u> <u>Mary Mure, San Francisco Zoo</u> <u>Diet Notebook</u> <u>South Florida Chapter, Miami</u> <u>Membership Directory</u> <u>Pat Sammarco, Lincoln Park</u> <u>Exhibit Design</u> <u>Diane Forsyth, Akron Zoological Park</u>
---	--

Keeper Data Survey

Mary Slaybaugh, San Antonio & Dave Orndorff, Sea World Shark Institute

REGIONAL COORDINATORS

Mike Carpenter, Phoenix Zoo, AZ, Director

Linda Rohr Vacancy Gene Pfeiffer Angela Keppel Lee Payne Lynne Villers Larry Sammarco Vacancy Alan Sharples Vacancy Candy Kroft Laurence Gledhill Joanie Stinson Vacancy	W.D. Stone Memorial Zoo Philadelphia Zoo National Zoo Detroit Zoo Indianapolis Zoo Lincoln Park Zoo Atlanta Zoo Rio Grande Zoo Woodland Park Zoo Phoenix Zoo	ME, VT, NH, MA, RI, CT NY PA, NJ, MD, DE VA, W. VA, D.C. MI IN, OH, KY WI, IL, MO, MN, IA TN, NC, SC FL, AL, GA AR, MS, LA TX, NM, CO, OK, KS, NE SD, ND WA, OR, ID, MT, WY, AK CA, NV, AZ, UT, HI Canada
---	---	---

Scoops and Scuttlebutt

FROM THE EDITOR'S DESK

The Editorial Staff of *Animal Keepers' Forum* is pleased to bring the AAZK membership this expanded December issue. It contains not only some of our regular features, but also many of the fine papers presented at the AAZK National Conference in Philadelphia this past October. The Proceedings of the annual meeting of the AAZK Board of Directors are also included and will update the membership on the activities of the Association during the past year. A limited supply of this special Conference Proceedings issue are being printed and may be purchased from National Headquarters for \$6.00 per copy. Those whose membership is current as of 31 November, 1983 will receive this issue on the regular AKF mailing schedule. We wish to thank all those who have contributed to the growth of AKF during the past year. The Editorial Staff greatly appreciates your interest, support and input into your Association's professional journal.

AAZK BOARD OF DIRECTORS SETS REVISED INTERNATIONAL MEMBERSHIP FEE

Due to the ever-rising postal fees for international mail, the AAZK Board of Directors has set new membership fees for ALL international members. Effective for new members and those renewing their AAZK membership after January 1, 1984, the cost for an International Membership will be \$25.00 (U.S. Currency). All international members, whether full-time keepers or not, will be required to join AAZK under this category. While the Board was reluctant to increase fees, the cost of postage for correspondence and mailing *Animal Keepers' Forum* outside the U.S. has risen to the point where the budget cannot accomodate international members joining at Affiliate or Associate rates. This rate increase does not affect Canadian members, as the postage costs are the same for Canada as for within the continental United States. It is sincerely hoped that our international members will understand the need for the change and that they will continue to support the efforts of AAZK.

AN OPEN LETTER TO AAZK FROM ED ROBERTS

Dear AAZK Members,

I wish to extend my gratitude and sincerest thanks to Mike Crocker, the AAZK Staff and Awards Committee for bestowing the Distinguished Service Award on me at the convention in Philadelphia.

As former President of the AAZK and a member for the last 15 years, I have seen it grow from its infancy to a giant in its field of animal professionalism through the *Animal Keepers' Forum* wherein keeper members write articles of professional caliber about the animals for which they care.

I recall in 1972, at the convention in Honolulu, that a very well known Zoo Director said to me, "Ed, these papers presented here are of the finest professional material I have ever had the opportunity to listen to. Their lay language and technical aspects are absolutely astonishing."

It just proves the point that Red Sweeney, our first Executive Secretary, made in 1967 when he first started up the AAZK, that all Animal Keepers are Professionals.

As a long-time member of the AAZK, I was only too happy to write my views, and through the "Elephant Set", tried to get more people interested in writing about their elephants. Needless to say, I will continue to send in articles, for after 30 years of Zoo Keeping, I have a lot to talk about!

Again, thank you all for this honor.

Ed Roberts
Senior Animal Division Supervisor-Ret.
Professional Animal Keeper

from the President

Dear Fellow AAZK Members,

Having done a fine job of coordinating Chapter formation and activity, Patti Kuntzmann is giving up that position. We owe her our thanks for the time and effort that has been involved in helping our Chapters function smoothly.

During the Philadelphia Conference, Gerald Payne volunteered to take the position of Chapter Affairs Coordinator and his appointment has been approved by the Board. Congratulations to Lee for his commitment to serve AAZK. The files are in the process of being transferred to Lee Payne from Patti Kuntzmann, so please be patient with any time lag there may be in having your correspondence concerning Chapter formation and activity. All should be in order within the month.

The Chapter Affairs Coordinator is the one who answers your questions about the chartering process, and has information packets available for your chapter's period of formation. He can assist you in writing a chapter constitution, applying for a charter and beginning activities that will prove beneficial to your chapter and your zoo. Hints are shared between chapters, through the coordinator, on projects that work, and advice on those that don't go well in all situations. If you have questions, or need advice in chapter affairs, please contact Lee Payne at the Detroit Zoo. The Detroit Zoo coincidentally is the home of our newest Chapter.

Again, thanks to Patti, and welcome and best wishes to Lee Payne.

Sincerely,

Patricia E. Sammarco
President
Zoo Keeper



Births & Hatchings

DALLAS ZOO.....Tami Jones

B&H for October 1983 include: Mammals - 1.0 Dusky leaf monkey (DNS), 0.1 Suni antelope, 0.0.1 Hamadryas baboon, 0.0.1 Kikuyu colobus, 1.0 Reticulated giraffe, 0.1 Bornean orangutan, 0.0.1 Kirk's dik dik; Birds - 0.0.2 Yellow-fronted canary, 0.0.10 Gouldian finch, 0.0.1 White-headed piping guan, 0.0.1 Crested wood partridge; Reptiles - 2 Coahuilan box turtle, 0.0.11 Pueblan kingsnake, 0.0.1 Godman's viper.

MEMPHIS ZOO AND AQUARIUM.....Robert L. Evans

October 1983 B&H include: Mammals - 1.0 Guar, 1.0 Red lechwe, 1.0 Kirk's dik dik, 1.1 Nilgiri; Birds - 0.0.4 Ostrich, 0.0.1 Hartlaub's touraco, 0.0.2 Ringed teal and 0.0.2 Peking robin.

TAMPA-BUSCH GARDENS.....Sandy Moher

The following B&H were recorded for October 1983: Mammals - 1.0 Greater kudu, 0.1 Sitatunga, 4.2 Thomson's gazelle, 1.2 Addax, 1.1 Grant's gazelle, 1.1 Dama gazelle, 1 Black spider monkey, 0.1 Defassa waterbuck, 1.1 Blesbok, 1.0 Eland, 0.1 Cape buffalo, 1.0 Kafue red lechwe; Birds - 2 Lear's macaw, 1 Scarlet ibis, 1 Wattled curassow, 2 Yellow-billed hornbill, 3 Mandaya conure, 2 Crested tinamou; Reptiles - 22 Spectacled caiman.

OKLAHOMA CITY ZOO.....B.R. Smith

The Oklahoma City Zoo is pleased to announce the successful hatching and rearing of the following birds: 0.0.2 Golden conure, 0.0.2 Hyacinth macaw, 3.3 Electus, 0.0.2 Greenwing macaw, 0.0.1 Military macaw, 0.0.1 Spectacled owl, 0.0.1 Egyptian vulture, 0.1 Andean condor, 1.1 Ornate hawk-eagle and 0.0.2 Guiana crested eagle.

MILWAUKEE COUNTY ZOO.....Steven M. Wing

B&H for September-October 1983 include: 0.0.1 Indian fruit bat, 0.0.1 Patagonian cavy, 0.0.2 Red acouchi (0.0.1 DNS), 0.1 Mandrill (DNS), 0.0.2 Bat-eared fox (0.0.2 DNS), and 0.1 American elk.

MIAMI METROZOO.....Lori Bruckheim

Miami Metrozoo's B&H for September-October 1983 include: Mammals - 0.1 Malayan tapir, 0.1 Blackbuck antelope, 1.0 Chamois, 0.0.2 Sugar glider, 1.0 Sambar deer (died, age 24 days), 1.1 Nilgai (1.0 died, age 3 days), 1.0 Pygmy hippopotamus, 0.1 Eld's deer, 0.1 Sable antelope, 1.0 Siamang; Birds - 0.0.11 Java tree duck, 0.0.2 Grosbeak starling (DNS--believed to be the first captive hatching), 0.0.1 Sarus crane; Reptiles - 0.0.4 Siamese crocodile and 0.0.4 Leopard gecko.

BROOKFIELD ZOO.....John S. Stoddard

October 1983 B&H include: Mammals - 0.0.1 Rat kangaroo, 0.0.6 White-toothed shrew, 0.0.5 Spiny mouse, 0.0.3 Acouchi, 0.0.4 Degu, 0.0.2 Callimico monkey, 0.0.1 Guinea baboon; Birds - 0.0.1 Red and white crane.

BIRTHS AND HATCHINGS, Continued

LINCOLN PARK ZOO.....Randy McMahon/Susan Moy

The B&H for October 1983 are: Mammals - 0.0.1 Squirrel monkey, 0.0.3 Cotton-top marmoset, 0.1 Marbled cat; Birds - 0.0.2 Nicobar pigeon (0.0.1 DNS), 0.0.2 Yellow-fronted canary (0.0.1 DNS), 0.0.1 Superb starling; Reptiles - 0.0.6 Texas long-nosed snake.

AUDUBON PARK & ZOOLOGICAL GARDEN.....Dee Nelson

October B&H include: Mammals - 0.1 Sitatunga, 0.1 Sable antelope, 1.0 Muntjac, 1.0 Blackbuck, 0.1 Thomson's gazelle; Birds - 0.0.1 Sun conure.



Coming Events

AAZPA GREAT LAKES REGIONAL CONFERENCE

March 4-6, 1984

Chicago, IL

For details contact: Tom Meehan, DVM, Lincoln Park Zoological Gardens, 2200 North Cannon Drive, Chicago, IL 60614.

AAZPA WESTERN REGIONAL CONFERENCE

March 18-20, 1984

Grand Rapids, MI

AAZPA SOUTHERN REGIONAL CONFERENCE

April 1-3, 1984

Little Rock, AR

AAZPA CENTRAL REGIONAL CONFERENCE

April 15-17, 1984

Omaha, NE

AAZK SOUTHEASTERN REGIONAL CONFERENCE

April 19-21, 1984

Columbia, SC

Hosted by the Riverbanks Zoo AAZK Chapter. Registration fee is \$25.00 for members and \$30.00 for nonmembers. Those wishing to present papers should submit abstract or outline by 15 February, 1984. Registration fee will be reduced for those presenting papers. All conference events held on the grounds of Riverbanks Zoo. Registration forms can be found on page 345 of the November 1983 AKF. Contact: Stephen J. Danko, Conference Coordinator, Riverbanks Zoo Chapter AAZK, 500 Wildlife Parkway, Columbia, SC 29210.

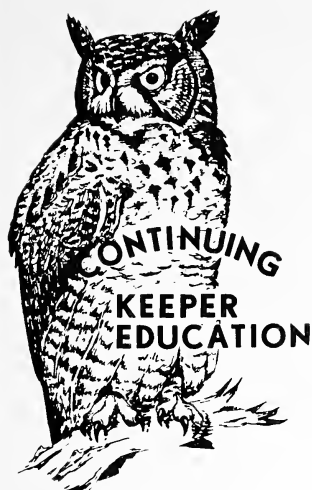
1984 AAZK NATIONAL CONFERENCE

Sept. 30-Oct. 4, 1984

Seattle, WA

Hosted by the Puget Sound Chapter of AAZK at Woodland Park Zoological Gardens, 5500 Phinney Avenue North, Seattle, WA 98103. Watch upcoming issues of AKF for conference hotel site, registration forms and additional information. "Finders Keepers, No-Shows Weepers"!





SPECIAL SESSION ON STAFF TRAINING AT THE '83 AAZPA CONFERENCE IN VANCOUVER

At the AAZPA Conference in Vancouver, Helen Freeman, Curator of Education at Woodland Park Zoo and I co-chaired a special session on staff training. The session came about when a paper on the subject which Helen submitted for the general session was not scheduled because it was felt that the subject wasn't of general interest. However, Helen persevered and was given an hour time slot and a room for 50 people to hold the special session. Sixty-five people made it into the room and others

were turned away. Several comments were made during the course of the conference that others had wanted to attend but either couldn't get in or had a conflict with a concurrent session. Apparently, the interest was there after all. This is the first in a two-part series on the session; following is Helen Freeman's introduction to the need for staff training and how to put a program into operation. ---Judie Steenberg, Coordinator, AAZK Education Committee.

In a survey conducted at the AAZK Conference in 1982, 35 out of 50 delegates said they did not have a training program in their Zoo. The purpose of this special session is to address why such a program is needed, and to discuss ways to help solve the principal reasons that were given for not having such a program; one, no time to produce or develop one, and two, lack of interest on the part of management.

It used to be that using only on-the-job training was enough, even for such diverse jobs as keeper or the individual handling the animal transactions. Exhibitory concentrated on finding the most efficient ways to clean an enclosure, and having any information or graphics on the animals was a plus. That day is no more. The public has become sophisticated, the animals have become more expensive and conservation has become critical. (It could be compared to the on-the-job training you may still get in something like the jewelry business--you learn to cut valuable stones by first practicing on the easily replaceable ones like zircons before moving up to diamonds. But now all of our animals are like diamonds--mistakes are very expensive, and we may not be able to replace what we've lost. Even with a species which is not endangered, public criticism from animal loss due to bad management is an important factor.

There is another reason that zoos need to update their thoughts on training and that has to do with the fact that there is a major change occurring in many businesses today. That is a change in corporate policy from one which could be called Scientific Management--the use of employees as if they were machines--to one which could be titled Humanistic Management, which has an emphasis on developing the commitment and participation of the employees. The product is a happier employee, with less turnover and higher capability. The by-product is increased productivity, fewer accidents and more efficient use of the resources of that institution, whether profit or non-profit. For the staff, and especially the non-management employee, this can be like shifting gears from a passive to an active work style.

CONTINUING KEEPER EDUCATION, Continued

There are a couple of basic components necessary to make this work: A people-oriented management, one that realizes that employees cannot be taken for granted and that an employee who comes to work enthused makes the difference between stagnation and inspiration for that institution. Just as necessary is an employee who is willing to participate and be flexible enough to change. That's why it is kind of like shifting gears--both areas have to make a move.

So, recognizing this as a change, how can we make it work for us?

1. The first, and most important step, is that you get a commitment from your director that he supports a training program for zoo staff. The elements that I just brought up explaining that training increases motivation and competency also have the by-products of lower turnover, fewer accidents and a higher productivity at lower cost. These are important advantages to a zoo director.

2. Give it a name so that it has an identity. You can call it something like Continuing Education or Continuing Competency for the Zoo Professional and hopefully that will soothe the ego of the person who thinks he or she knows everything.

3. Form a steering group consisting of one senior staff member, one education staff person, and one individual from the keeper staff. Reasons for this troika: The senior staff member, now that the director has given formal support to the program, will have the authority to set aside the time during the work day (say two hours a month) for the regularly scheduled training session. He or she will also have valuable input as to the priorities for training which are best for that particular institution. The education person will have the expertise to assemble materials and coordinate the individual sessions so they achieve the desired results. The keeper can evaluate the materials and resources available so that they adapt to the jobs at that specific zoo. No one knows a job better than the person who does it, and in this way the expertise can be put to work.

4. Select a chairman from this group who has the primary responsibility to keep it moving.

5. Pick one specific topic, such as safety or animal restraint, to start with. Decide how many sessions you want to devote to this and use it as a pilot project. It is important to keep it simple and not chew off too much.

In summary, it is important that all or most of these elements are present so that the program can have longevity, so it does not die out in a matter of a few months, but a system is built in for it to go on for years. By doing this you make the difference between a zoo that can keep up with the changing times and become outstanding or one that remains stagnant.

Part two of this article will cover current programs, the tools available to conduct a Staff training program, and AAZK Education Committee projects. Till then remember: *The key to success is having a commitment and working cooperatively.*



Conference.....83

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S ANNUAL MEETING

Submitted By
Patricia E. Sammarco

With Board members Connie Cloak and Kevin Conway present, President Pat Sammarco called the meeting to order at approximately 9 a.m. The meeting continued throughout the day, with business finished at approximately 6 p.m. Most committee and project heads submitted written reports as to the year's activities, and some were at the meeting. As usual, the meeting was open to all and many members attended and participated in discussion. Asterisks (*) note those present.

Administrative Secretary's report - The proposal to increase the Overseas member's fee to \$25.00 (U.S.) regardless of category was approved. Membership category will still be noted for DIRECTORY information. A questionnaire to find reasons for dropped membership has been used in the past, and headquarters will be advised to check the files to determine the feasibility of continuing its use, or using this as a guide for the development of a more current form. Budget adjustments will be included in the following committee reports and discussions.

Chapter Affairs Coordinator - Patti Kuntzmann has resigned this post and Gerald Payne of Detroit Zoological Park has been appointed to the position. He has requested that his budget remain at \$25 to cover postage and incidental expenses.

International Affairs Coordinator - Randy Adolph has been active in communicating with foreign zoo keepers and their associations. He has requested that his budget remain \$25 to cover postage and incidental expenses.

Nominations and Elections Committee - Lynne Villers did an outstanding job in coordinating the election of the board members to serve the association from January '84 through December '87. These are: Vernoa Barr, Mike Carpenter and Jean Hromadka. Jean was elected to serve as Vice-President for two years; Pat Sammarco's presidential term ends this year, with her Board term continuing through December '85; Kevin Conway has been elected to serve the rest of his Board term as President through '85. The committee reported expenses of \$38.41 to cover copying, phone and postage costs, not including printing and mailing of ballots which totaled \$329.22 at national headquarters. Lynne indicated a problem in getting enough nominations, and in having nominated members submit their biographical information. Since one ballot was submitted as a photocopy, we will need to include a note with future election materials that only original ballots will be counted. Since this committee only functions on alternate years, their budget allotment needs to be carried over to 1985, but eliminated from the 1984 budget.

Regional Coordination - With the recommendation of Coordinator Director Mike Carpenter, and after discussion, it was decided that the system is viable and should be continued, but with some revamping and new approaches. This decision had been tabled since last year's meetings, pending analysis. Regional activity will be emphasized, with all members encouraged to promote AAZK and its programs, using the coordinators for advice, assistance and coordination. Symposia and regional conferences will be encouraged. Louisville Chapter has been active in this and Riverbanks Zoo Chapter will

OVERVIEW OF 1983 AAZK BOARD OF DIRECTOR'S ANNUAL MEETING, Continued

host the first named regional in April 1984. Other zoos are interested as well. The number of regions will be reduced from 14 to 9, and the concept of allowing Chapters to act as Regional Coordinators was approved, noting that a specific member is to be named correspondent. The proposal to eliminate Board approval of RC appointments was rejected; recommendations by the Head RC are traditionally approved, but the formality needs to remain in Board hands. The Board will request that reasons for changes in appointments be submitted, and promised haste in decision making. Mike has written guidelines that are to be published in AKF, and will otherwise be available from him for those interested in serving the association as a Regional Coordinator. The budget proposal was discussed at length. Postage reimbursement has been the standard. With only \$21.71 used last year, the request for \$300 was determined impractical. Reimbursement for receipts will continue and increase proportionate to use. The request to provide funds to assist RCs as they represent AAZK at AAZPA conferences was approved, with the registration fees available on request by Mike Carpenter for RCs provided that they work as representatives of AAZK by presenting AAZK reports, setting up discussions on AAZK activity, and making AAZK items available at the conferences. The Head RC will have the responsibility to request time and facilities for AAZK presentations at the AAZPA Conferences, assigning local RCs to participate or find representatives.

*Continuing Keeper Education - This is the most active group in AAZK, actually being a number of sub-committees under the leadership and coordination of Judie Steenberg. By the Seattle Conference, Judie will have the committee running smoothly, and will step aside.

Continuing Keeper Education Column in the ANIMAL KEEPERS' FORUM regularly reports on activity and solicits member support.

*Manual Review - The group will not develop an AAZK manual, but reviews the materials from other sources. Their recommendation to those seeking a training program for Keepers is to use the AAZPA Manual as a guide, and encourage Metro-Toronto to release its manual as a reference.

*Audio-Visuals - The Keeper Safety video tape has been completed, and with considerations for the techniques of distribution soon to be clarified and should be available by the end of the year. The program was reviewed and enthusiastically accepted. The merging of the Program Library Project with the Keeper Training Video sub-committee will be considered. Rental/purchase agreements will be worked out with funds being slated to the production of further tapes, including the possible production of Judie Steenberg's "Keeper's Role in Zoo Animal Health", a 2-part production. Tapes purchased to produce the safety tape will be retained and reused. Reimbursement to B. Wayne Buchanan for a balance of \$69.63 was approved. Other keepers and chapters will be encouraged to develop tapes, especially those that will fulfill a long-standing agreement with AAZPA to compliment their training manual, and a granting system will be established. The KTV group will currently handle distribution, development of brochures and formulating procedures for further productions, emphasizing both quality and educational content of tapes.

Staff Exchange - Elandra Aum has been developing guidelines for participants in the exchanges, will be analyzing problems faced by both individuals and institutions, will be looking for sources of possible funding to help support exchanges, and has a list of 21 interested institutions. She is disappointed in the fact that many more institutions responded to her request for information and interest than did keepers. The China trip may be cancelled due to lack of participation. Seven or eight participants with their deposits paid are necessary. The requirement of paper submission is not mandatory and should not stand in the way of those wanting to participate in the symposium with Chinese zoo keepers.

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S ANNUAL MEETING, Continued

Program Library - This project has spent another inactive year and decisions are to be made as to the prospect of merging it with the Keeper Training Video project since both are aimed towards developing and distributing audio-visuals for keeper education.

Library Resources - This is an on-going accumulation of information on libraries and other sources of information. Ellen Leach sees the potential for growth of the list as Zoo Librarians organize, and she becomes our representative to that group.

*Reference Search - Liz MacLaughlin and Jenny Rentfrow are working on a computerized reference to information on topics pertinent to zookeeping. They request keeper input to guide them to information sources. Information will be categorized in a number of ways to produce computer/printer generated lists to aid in locating information on specific topics.

Zoo Keeper Fundamentals - Jim Ellis has proposed the development of a book to consolidate zookeeping information under one cover. This will be an ambitious undertaking with Pat Sammarco and Jim Ellis as co-editors, and will use the resources of all AAZK committees, especially the Education groups. Preliminary planning is underway.

Animal Management Course Certification - Judie Steenberg and Douglas Richardson have been working together on setting up means of certification for American keepers participating in the English correspondence course.

Keeper Fact Sheets - Quick reference to information keepers need on morphology, physiology and taxonomy of species may be developed after some research into feasibility of the project, and possible duplication of the efforts of the BIOLOGICAL VALUES committee.

Exhibit Design Forms - This project is in the development stages with Diane Forsyth coordinating the collection of information on exhibits. The concept is to provide a central source of information collected from keepers on exhibit design and construction.

Zoonosis Notebook - Bruce Clark has proposed a collection of information on zoonotic diseases and will be working on format and production of this project.

Education Committee Appointments - It was recommended that the committee stand at 20 members and the current approved members remain with new members added by Board approval as resignations cause openings. Current members are: Safety Project, B. Wayne Buchanan and Brenda Lodge; Reference Search, Liz MacLaughlin and Jenny Rentfrow; Manual Review, Jim Ellis, Bela Demeter, John Jaffee, Diane Forsyth, Beth Poff, Bruce Clark, Laura Treschel, Adrian Wright (conditionally Bill Hunt and Rick Gutman); Exhibit Design, Diane Forsyth, Beth Poff and Chris Rasums; Zoonosis Notebook, Bruce Clark; Animal Management Course Certification, Douglas Richardson; Biological Values Liason, Chris Rasums; Zookeeping Fundamentals, Jim Ellis, Pat Sammarco, Judie Steenberg, Adrienne Wright, Bruce Clark, B. Wayne Buchanan, Mike Coker, Frank Kohn, Douglas Richardson, Kevin Conway, Ken Reininger, and Dwight Knapik, Advisory Members - Pat Sammarco, Mike Coker, Kevin Conway, Frank Kohn and Dwight Knapik.

Budget - \$25 requested by Judie Steenberg was granted and the budget for the entire committee of \$600 was approved.

*Public Education - During the conference, Eileen Gherity proposed a project to examine the keeper's role in public education and initiation of this project was approved.

Looking to the Future/Film Project - This project has exceeded its original concepts and guidelines. Karen Starr Wakeland has resigned and the project has been permanently tabled as it stands.

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S ANNUAL MEETING, Continued

ANIMAL KEEPERS' FORUM - AKF is the ever-improving vehicle for keeper information and association news. Celebrating its tenth year in 1984, the AKF will publish information on the developmental history of AKF, AAZK and its programs. It was suggested that the cover revert to the original logo for the year, and that for one year only, subscriptions be made available to institutions at the price of individual subscriptions or as seen fit by the editors.

*AKF T-SHIRT - The project to produce and sell an anniversary T-shirt with the original AKF logo was approved. The funds from these sales are to go towards paying the expenses of the AKF editor's attendance at the 1984 conference in Seattle. This is a Puget Sound Chapter Project.

BIOLOGICAL VALUES - The gestation notebook project has merged with the Biological Values project. The publication is soon to go into its second, revised edition, containing previously unpublished information. The new edition will also go with the established price structure that allows Professional Members the lowest cost with appropriate increases for other members and non-members.

CAREER BROCHURES - These were produced in color this year with improvements on the text thanks to the Education Committee. Some discussion was held on the value of color, use of art besides and/or instead of photos, and comments were made on the information being too U.S. for Canadian use. All these issues will be considered before the next production.

*MEMBERSHIP DIRECTORY - The DIRECTORY is in the process of completion and will be produced soon with costs remaining approximately the same.

Book Reviews - This remains in the hands of Ellen Leach and adds the help of Janet Gailey Phipps and Tom Goldsberry. The requested budget of \$40 was approved.

*Diet Notebook - Ken Howell of the South Florida Chapter reported on the progress of the committee. With the approved appointments of Terrie Correll to collect Mammal diets and Kelli Westbrook to collect Bird diets as well as Janice Martin to coordinate activity in Canada, the data collection forms will be produced and distributed to our members. Sample forms and information will be published in AKF. The committee needs a volunteer member or chapter to collect Herp/Fish/Invertebrate diets. They will contact the AKF office about getting the forms printed.

Infant Development Notebook - The purpose of this committee is to collect information on mother-reared baby animals and should serve to complement the AAZPA Diet/Care Notebook.

*AAZK History - The committee will be busy this year producing articles for ANIMAL KEEPERS' FORUM on the past activities of the association and its projects. Larry Sammarco has had a great deal of assistance from Ellen Leach in accumulating information.

Keeper Data - This project remains under the coordinated efforts of Mary Slaybaugh and Dave Orndorff. The concept is to share information on who we are and why we are in the profession, as well as other related concerns. The current project underway is the "Burnout Hotline" to get good keepers past the occasional frustrations of our jobs.

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S MEETING, Continued

*Professional Standards - The committee has nearly completed its data search on job requirements and standards. Kevin Conway is stepping aside to let Janet McCoy and Steven Wing finish the collation of information. The project should be complete with a full report of findings made to the members at the Seattle Conference. The budget request for \$40 for postage was approved.

*Legislative Advisor - Kevin Conway continues to provide information on legislation that is pertinent to our professional concerns and advise members on possible activities to influence legislators. He has been locating new sources of information, and uses these to inform us through AKF. He continues as liaison with the AAZPA legislative committee. He recommends that the Conservation Directory, currently sent to national headquarters, be forwarded to him for use as a source. Kevin's budget of \$112 to cover postage and information source materials was approved.

*Research Grants - Frank Kohn has reorganized the grants committee and has been adding the benefit of his background in research. The committee has awarded a number of grants and is looking forward to more applications. Of three granted projects, one, Topeka Zoo's Connie Cloak and John Brannian, completed their Echidna study; Atlanta's Sue Barnard has submitted receipts and will be forwarding her text on reptile parasites, which may be published in similar format to BIOLOGICAL VALUES; Washington Park Zoo's Stan Held is finishing his frog project with results probably by the end of the year. This year two requests for funding were made. The library search to develop BIOLOGICAL VALUES I was funded by an AAZK grant, and Frank recommended with the Board approving, that BIOLOGICAL VALUES II draw a grant from 82-83 budget allotment. A receipt for \$15 in travel expense was disallowed. Kathy Wallace of National Zoological Park has submitted a proposal for an elephant nutrition study and the Board has approved this. This will be divided into a two-year, double-funded project with the second year's funds drawn from the 82-83 budget allotment. It was further decided that AKF publication of final results from a granted research project was not to be mandatory, but that the association must have first rights to learning the results, and an agreement to this end will be drawn. Frank's recommendations also approved by the Board include: 1) continuation of a quarterly grant structure, 2) requires the presentation of results of a study (with or without AKF publication rights) at the next AAZK National Conference; 3) acknowledge AAZK support funding in all reports, published or not; and 4) encourage use of AKF for information and sample requests, as well as related publications.

*ZOO BIOLOGY - Frank Kohn serves as our representative to ZOO BIOLOGY and is listed as consulting editor in the journal, Volume 2. Frank has requested funds to obtain Volume I and this is approved. Frank request that Dr. Terry Maple, editor of ZOO BIOLOGY be accorded a complimentary subscription to AKF was also approved.

*Research Advisor - Frank Kohn continues to maintain and establish contact with research organizations and asks members to keep him aware of associations they know, especially non-mammal groups, since he has mammal exposure. Members are encouraged to contact Frank for advice in setting up projects and he asks that any articles that members write on research techniques and related topics be copied to him, especially AKF items prior to publication so that he may set up a clearing house of information of keeper interest thus making them aware of specialists within the association. The total research budget from 1982-83 was \$978.93, leaving a balance of \$21.07. The projected budget to cover grants for 1983-84 is the approved sum of \$1000 to cover the prescribed upper limit of \$250 each for four grants.

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S MEETING, Continued

Awards Committee - The awards committee continues under the leadership of Mike Crocker to award peer recognition to our members through Excellence in Zookeeping, Meritorious Achievement and Zoo Keeper Education Awards.

*Seattle Conference - September 30 through October 4 promises to give us one more great national conference, this time with Puget Sound Chapter as hosts. Co-chairpersons are Harmony Frazier-Taylor, Debbie Stecher and Phil Pennock.

*Miami Conference 1985 - The Board approved the South Florida Chapter's bid for the 1985 National Conference and the following general membership meeting unanimously accepted Miami as the site for the 1985 conference. Members will be polled through AKF to determine post-conference trip preferences between Key West and the Everglades. The conference will include traditional professional and fun activities and will add "ZooOlympics". Three topics for the conference theme are being considered: The Keepers' Role in Management, Breeding Rare and Endangered Animals, and Husbandry of Traditionally Difficult Animals. Chapter discussions will narrow this down to one theme. Papers will be encouraged that bridge the gap between field conservation and captive wildlife management.

*Keeper Accomodations - A survey of accomodators to determine use of the system resulted in no replies, but two new accomodators. There are now 42 contacts in 26 states and 3 provinces to help provide lodging for traveling keepers. Postage and other costs are absorbed by the Metro Toronto Zoo Chapter so there was no request for funds from the national budget. Correspondence for information on the KAL goes to Oliver Claffey at Metro Toronto Zoo; Keeper contacts are noted in the MEMBERSHIP DIRECTORY.

Animal Data Transfer Forms - Use of the ADT Form continues to prove this an important and well-accepted tool of our trade. Major non-users are animal dealers (a survey of 22 animal dealers resulted in one request for forms), and zoos which have their own form. Poor response from the distribution of forms at AAZK Regionals, will eliminate this practice, although general acceptance and enthusiastic support has come from most zoos. Bernie Feldman will contact AAZPA to publish a survey on ADTF use in their Newsletter and encourage acceptance of this as the one form to use when shipping animals, to transfer care information. Bernie's request that his budget be increased by \$50 to \$550 was approved. 75% goes to printing and most of the rest for postage. The ADTF remain a free professional service of AAZK with 112 zoos currently using it.

Logo Decals - These are available from the Memphis Zoo Chapter.

Logo T-Shirts - In the first eight months that the Arizona Chapter has had control of the project, 182 shirts were sold to members in the U.S., Canada, Japan, Australia and New Zealand. Expenses of \$1139.32 and receipts of \$1242.25 show a profit of \$102.93 split equally between the chapter and national AAZK.

*Keepers Care Buttons - These continue to be available from the Lincoln Park Zoo Chapter with Larry Sammarco as coordinator.

PROPOSALS TO THE BOARD

A pay increase of 50¢ per hour was approved for Administrative Secretary Dolly Clark and AKF Managing Editor Susan Chan, with cheers and congratulations for jobs well done.

OVERVIEW OF THE 1983 AAZK BOARD OF DIRECTOR'S MEETING, Continued

The proposal to have an *ad hoc* board member at national headquarters was discussed and rejected. However, national headquarters will henceforth get copies of all administrative mail, rather than being copied only topics of their specific concern.

The proposal to have regularly scheduled conference telephone calls between board members was rejected in the name of costs that were not warranted.

Proposals to design methods to improve board and administrative communication led to the decision to once more define inter and extra-board communications and flow charts. The proposal to hire a management consultant was tabled.

During the next three months, as the administration of the association changes, board members will be reassigned areas of responsibilities for committee oversights, and projects will have new board member advisors. The transition should be smooth. It was agreed that the named offices of Secretary and Treasurer would fall to the president for the sake of continuity with the actual work remaining in the hands of the administrative secretary.

Board discussions and decisions continued at spontaneous times throughout the conference. These have been incorporated into the above reports for the sake of logic and congruity.

Once again, the board meetings were finished, for the most part, in one day's discussions. Thanks to the attending board members, project heads, and especially to the interested members who contributed to the meeting.

Minutes of the General Membership Meeting 2:30 PM, October 6, 1983, Philadelphia, PA

President Pat Sammarco opened the meeting and, with the assistance of the committee heads present, reported on the decisions and reports of the board meetings of Sunday, October 2, 1983. The only decision to be made by the membership vote was for the location of the 1985 National Conference. After the presentation of professional, educational and recreational activities available in Miami, the decision was unanimous to select this as the conference site. The meeting was closed with a show of obvious enthusiasm and excitement for the state of the association.



USING EMPATHY AS A TOOL IN ANIMAL CARE

By
Connie Cloak
Zookeeper-in-Exile
Cheekwood Botanical Gardens
Nashville, TN

We who strive for professionalism in the zoo business tend to consider a 'scientific,' objective attitude to be always the most desirable approach. To the extent to which this helps us to view our animals clearly, to solve problems efficiently and to communicate with each other concisely, it is obviously a very useful approach. I think that there are times, however, when information and ideas are disallowed because they come from a more subjective source. We often use the word 'empathy' assuming that we know what it means and it's a desirable quality to have. I think many keepers will agree with me that being able to sense the feelings and needs of our animals is a very important part of what makes us able to care for them appropriately. Because it involves subjective, non-verbal experience, empathy is difficult to talk about. It clearly exists (or happens) but what is it? Do we somehow 'astral project' ourselves into another being's skull? How do we know what they're feeling? I've come up with some ideas on what empathy is and how we can use it effectively in caring for our animals. To explain them, I'll have to introduce some other ideas involving subjective experiences before coming back to the concept of empathy.

There is a sensation which many, many writers much more gifted than I have tried to describe; a feeling which for want of a better term, I'll call the 'sense of harmony'. It seems to be characterized by a paradox: while one has a sense of merging with something greater than oneself, one also feels a strengthening of self, a feeling of 'completeness.' It's a sensation people seem to universally strive for, a sense of 'rightness' or being 'at peace.' It seems to me that this sensation is the natural one of any organism in the environment to which it is suited. At the species level, organisms evolve to respond to their environments in very intricate and detailed ways. At the individual level, there are built-in means to suit the organism more perfectly to respond to very specific situations, learning and reasoning being the most elaborate of these means. When things are right, an organism's adaptations and the demands made on it by its environment are in a sort of balance. Humans have been in an essentially alien environment, physically and socially, since sometime around the development of agriculture in prehistoric times. Being a flexible critter, we do pretty well at maintaining ourselves, but that sense of being in perfect balance with our surroundings, the 'sense of harmony' is very elusive.

An essential part of bringing oneself into balance with the environment involves first comprehending it. The world outside us is much more complicated than we are ourselves, so we break it up into chunks. Reflexes, conditioned responses, and learning are all ways of doing this. A brain is largely a device for filtering out a lot of the environment and categorizing the rest into manageable chunks. This gives us the flexibility of responding to the world in a more complex way than does, say, a plant, while still maintaining a sense of harmony.

As I see it, empathy has three necessary components, each a type for organizing chunks of our environment to make it more comprehensible.

First, one must recognize another organism as a unit, discrete from the rest of the environment. This is not necessarily as obvious as it sounds.

USING EMPATHY AS A TOOL IN ANIMAL CARE, *Continued*

For example, a newborn baby goat is 'programmed' to recognize a certain chunk of its environment: two vertical lines, a couple of feet apart. Encountering these, he walks between them and searches for teats. The rest of his mother is irrelevant to him. As he grows older, he begins to respond to his mother as a whole, recognizing her from among other goats as an individual.

The second component is identification of the other as a being like oneself. This makes it possible to make assumptions about the other based on what one knows about oneself. It makes the part of the environment that consists of other living things more comprehensible, but is limited as it tells us nothing about other organisms that is not true of ourselves.

The final component involves that 'sense of harmony' I talked about earlier. It involves recognizing that the other organism exists in a balance with its environment as we do, but that the specific details of both that environment and its responses to it are different. By observing these details, one achieves an understanding of it that can feel almost as though one were experiencing that environment with it. For an animal like ourselves that must live very closely with other individuals to survive, it's a wonderful way of understanding an important part of our world.

Empathizing therefore involves more than simply feeling, or identifying, or imagining what it would be like to be another being. Rather, it is a complex phenomenon in which we use some of the mechanisms we have for maintaining ourselves within our own particular environment, and apply them to understanding the needs of another organism.

I hope it will be obvious that in order to understand how an organism and its environment interact, we must gather as much information as possible about both. This is perhaps the biggest misconception about empathy; that it is apart from or a substitute for observing and learning. We can fulfill the second component of empathy that I defined without gathering much information about the other organism--we can identify with it by recognizing that it is a being like ourselves. This does not tell us much, and can lead to erroneous assumptions. If we are dealing with a very different organism from ourselves, say a philodendron, it is simply ridiculous. With the 'higher' animals, it can be downright dangerous, as we make assumptions simply because of their similarities to us, while ignoring important differences. An example is the diet fed to the first great apes in captivity, which included beer, meat, and bread: the diet of their keepers!

The most important way of increasing one's ability to empathize effectively is therefore to gather as much information as possible. We will never be able to understand everything about an organism, even the most simple such as protozoans or those most like us and whom we know best such as our mates or children. But, we can get closer to understanding as we learn more. Every kind of information pertaining to our charges is valuable, whether observed, read, or formally studied.

Realizing that we can never attain the goal of complete understanding should help us to be humble and to retain an essential openness of mind. We have to be always aware that every moment that we're around them, our animals are showing us things about themselves and what their world is like, if we can only be receptive to that information.

One of the biggest problems with using the subjective sense of empathy in our work is that it is difficult to communicate to others. Most of

USING EMPATHY AS A TOOL IN ANIMAL CARE, Continued

us have probably had the frustrating experience of being certain that 'something is wrong' but being unable to provide concrete evidence of it to others. While it is important to take these hunches seriously, we must realize that others have a right to question them before acting on our advice. Even the most experienced and perceptive keeper can misinterpret a situation.

Oftentimes, an empathetic awareness of an animal's needs can be a starting point to reaching a more defined understanding. If, for example, I sense that certain animals are uneasy or 'not right' in their exhibit, I can try to pin down what gives me that feeling. I may spend more time watching them, monitoring their food consumption, reading up on their natural environment and behavior for comparison, examining their captive environment with a new eye for stress factors, consulting with other people who have experience with the species, and finding what's in the literature on their captive maintenance. All of this will not only help me to better understand and empathize with the animals, it will also give me concrete material to back up my 'gut' feelings about what changes should be made in their management.

As much as our ability to design exhibits, fly captive animals around in jet planes, and write articles on animal care for zoo journals, the ability to emphasize make us wonderfully suited to be zookeeping animals. Just as we don't always design good exhibits, practice good judgement in animal transport, or write good articles, we don't always practice good empathy. I feel that empathy is not only one of our greatest tools, but one of our greatest rewards: what could be more exciting than to achieve a glimpse of what it's like to be a tiger, a toucan, a gecko or a tarantula?



One call does it all!

NEBRASKA BRAND



Quality Assured Diets
That Have
Constant Formulation
For
Balanced Nutrition
And
Economical Feeding

Frozen Feline Diets
(Horsemeat or Beef)

Frozen Bird of Prey Diets
(Fine or Coarse Grind)

Frozen Canine Diet

Chunk and Chopped Horsemeat,
Hearts, Livers, Rib, Shank and
Knuckle Bones



SPECTRUM

Banana Flavored Primate
(15% Protein)

Banana Flavored Primate
Pro-Plus
(25% Protein)

Omnivore Dry

Polar Bear Dry

Canine Dry

Ratite Dry

Hoofstock Supplement
(with Selenium)

TOLL FREE

(800)

228-4005
In Nebraska, call collect
(402) 488-6492

Zu/Preem

Feline Canned

Primate Canned

Marmoset Canned

Ratite Dry

Omnivore Dry

Primate Dry

Animal SPECTRUM Inc.

5801 Locust Street

Lincoln, Nebraska 68516

READAPTING A TROPICAL SPECIES TO THE TROPICS (*Callimico goeldii*)

By
Sally Lieb, Senior Keeper
Dreher Park Zoo, West Palm Beach, FL

Callimico goeldii was the most recently discovered primate in South America. Even after its discovery in 1904, relatively few animals have been collected.* Taxonomists would probably prefer to ignore them completely.

Previously all platyrrhine species could be fitted nicely into one of two major groups. With its diminutive body size (avg. 450 g.) and non-prehensile tail, *Callimico* looks like a member of the Callitrichidae family. Laterally compressed claws on all digits except the nail-bearing hallux and a high-pitched song add strength to the Callitrichid relationship. However, *Callimico* diverges from the marmoset line in having single births more often than twins and three molar teeth. These are characteristics of the Cebidae. The monospecific family Callimiconidae seems to be the best solution to this primate's classification problems.**

RELOCATION OF FAMILY

A family group consisting of four animals arrived at Dreher Park Zoo, West Palm Beach, Florida from Brookfield Zoo, Chicago, Illinois on 7 October, 1981. In Chicago the group was housed indoors at all times with no human contact (visual or otherwise) other than keepers and veterinarians. A detailed husbandry and breeding protocol was sent to us along with the family. Following this protocol to the letter and calling their former Brookfield keeper with any questions enabled us to adapt the animals quickly. Stress-related illnesses are often fatal to small, high-strung primates. It is therefore imperative to minimize changes and to achieve necessary changes gradually.

HOUSING

Our temporary cage, made of wood and 2.5 cm x 5.0 cm wire and measuring 2.4 M x 2.4 M x 2.0 M, was set up inside the zoo hospital. Following the protocol, two nest boxes were mounted high in the cage. Three feeding stations and two ledges were also mounted in the upper areas. Other perches consisted of ficus tree branches of various diameters. Because one of the offspring was only 39 days old, the wire floor was covered with cardboard and a deep layer of wood chips. This youngster began running about on his own the day after his arrival and fell to the soft bedding often. Temperature and humidity were maintained at about 24°C (75°F) and 0.6 respectively. We found it impossible to prevent some fluctuations so the animals caught mild colds. Perhaps in the long run the animals benefitted by building up a resistance in anticipation of their move to the outdoor exhibit. They have not experienced any cold symptoms since the first few months.

PRELIMINARY EXPOSURE

To further adapt the *Callimicos* toward their future outdoor area, the temporary cage had been set up next to a large window (1.65 M x 1.5 M). During the first three months, this window was covered by a board, but when people approached from the outside, the *Callimicos* could peer around the edges of the board at them. The younger animals particularly enjoyed looking out at people. Although viewers outside the window were objects of curiosity, strangers entering the room were greeted with aggressive leaps and loud alarm calls accompanied by piloerection and stiff-legged stances.

READAPTING A TROPICAL SPECIES TO THE TROPICS, Continued

Beginning in January, 1982, the board was moved aside for approximately fifteen minutes three days a week. Again, the response was mild curiosity. The Callimicos were able to see canals, plants, sky and ground fowl as well as zoo visitors. The door to the outside was opened once a week to expose them to novel sounds and scents. During episodes of respiratory infection and new births, these exposure techniques were discontinued.

By April of 1983, the outdoor exhibit was nearly completed. During the eighteen month interval, three youngsters had been born and the oldest shipped out. The group exhibited all normal behaviors reported by other institutions.* None of the neonates had to be pulled for hand-rearing.

However, the first offspring born at Dreher Park Zoo (12 April, 1982) died at age 6.3 months. Within two weeks after first trying solid food, she developed a craving for feces. By 20 August, 1982, she was observed eating excrement every day. She began to develop fluid build-up in face and abdomen. On 15 September, 1982, the five-month-old was moved to a cage next to the family group but she continued to consume her own feces and minimal amounts of her normal diet. She also craved crickets, mealworms and newborn mice. In spite of vitamin supplements and a battery of symptom-fighting medications, the Callimico died on 20 October, 1982. Necropsy revealed only severe malnutrition. Although coprophagia has been observed frequently among all the rest of our group, this severe condition has not recurred. We have found that feeding insect supplements at the first light each day draws attention away from the morning bowel movements.

After the loss of the first Callimico, the brief exhibiting and door opening system was resumed. The second birth occurred 19 October, 1982. Exhibit times were not increased until 15 April, 1983. By that date, our third neonate was eight days old. The board was moved away from the window for ten minutes each day. Fresh air was allowed to flow in through an open door three times a week. The exhibiting time was increased gradually until the animals were displayed for two hours daily beginning 27 April, through 11 May, 1983. The reactions of the Callimicos remained consistent; they were curious about visitors outside the glass but aggressively frightened by strangers who entered the room.

On 11 May, 1983 the family of five was moved to the indoor, off-exhibit section of their new home. This section, somewhat larger than the temporary cage, measures 1.9 M x 3.3 M x 2.74 M. The ceiling and walls are covered with tile board, a very smooth material that is easy to clean. The overhead light fixture is encased in a hardware cloth box. Perches consist of ficus branches, wooden dish holders, and one of the nest boxes from the holding cages. Less than one meter above the floor a plastic catch net of "half-shade" or seran (used by plant nurseries) is mounted to protect fragile bones from falls to the concrete floor. This screen is attached to the walls with velcro strips to provide easy removal for cleaning. When the door to the darkened keeper work area is closed, animals may be watched unobserved through a pair of 46 cm square windows. Painted screens on these windows serve to hide the observer and prevent the Callimicos from seeing their reflections.

A reverse cycle air conditioner runs in the work area controlling the temperature in the cage through a small vent above the door. A second vent in the roof pumping air out would improve circulation. The work

READAPTING A TROPICAL SPECIES TO THE TROPICS, Continued

area also contains two small capture nets. Just inside the door to the outside is a shallow disinfectant foot bath into which all entering personnel must first step.

During the initial moments after being moved, the *Callimicos* were confused by their inability to cling to the walls. Habituated to wire mesh walls, they tried repeatedly to climb the slick tileboard only to fall to the catch net below. After a few seconds they turned to the branches and hopped to the top of the nest box which was covered with familiar scents. There they remained for the majority of the day except for some brief excursions around the light fixture screen. Several more attempts were made to climb the walls but they quickly learned to catch themselves on branches before falling all the way to the screen. The group refused to approach the food dishes until they were placed on the nest box.

The following morning (12 May, 1983) two branches from the holding cage, sticky with their scent markings, were added to the network. These familiar branches increased the *Callimicos*' movements markedly. They spent about 75% of the observation time on the house or investigating the new place while perched on the familiar branches. Normal activities such as scent marking, grooming and vocalizing resumed. During the ensuing five days, uncommon behaviors noted occurred between parents and offspring. Once there was a mouth-to-mouth "kiss-like" exchange between the adult male and the oldest son, followed by a prolonged hug around the shoulders. This hugging behavior occurred several times, probably serving as reassurance to the twenty-month-old subadult.

Eight days after moving (19 May, 1983), the *Callimicos* were allowed access to the outdoor area by opening two 46 c. square doors. These doors are located at the outside end of an "L"-shaped chute designed to counteract winter's northerly drafts. Hinged at the bottom and supported by a small chain running between the wall and the top, each door provides a nice ledge for the monkeys when open. The outside section, 6.6 M x 3.3 M x 2.4 M, is supported by concrete blocks and utility poles. On the public viewing sides, five plexiglass panels (each 1.2 M sq) are installed in cedar frames, tilted slightly off the vertical in order to minimize glare. An overhead cedar trellis extending out from the top of the cage also helps to reduce glare and to discourage public feeding. The non-public side perpendicular to the indoor quarters and the top of the cage is made of 2.5 cm x 5.0 cm wire. Perches in the outdoor exhibit are predominantly live plants.

Also included are two sapodillas, green buttonwood, pride of Bolivia, sea grape, several sea hibiscus and ficus, and a guava. Banana trees provide a nice broad leaf for collecting stool samples. However, they also tend to attract insects and spiders, some of which can inflict fatal stings to our curious young primates. A deep layer of mulch, various ferns, vines and bromelids provide the substrate. Skinks, anole, ants, spiders and toads abound in the constantly damp exhibit. Orchids and bromeliads highlight the topmost areas of the wire side. At the base of this side, a 15 cm high section of hardware cloth is attached to discourage rats and snakes from crawling into the exhibit. Water and food dishes are mounted one meter above the ground to further deter uninvited native species.

From May through September, south Florida temperatures range between 25°C and 35°C (78°F - 95°F) and the humidity is always above or near 90%. The *Callimicos* have not been discouraged by this novel atmosphere. On 18 May, 1983, the first day the doors were opened, every member of

READAPTING A TROPICAL SPECIES TO THE TROPICS, Continued

the family emerged for many brief inspections of the outdoors. On the third day, two, well scent-marked branches from the temporary cage were added to the outside area. By this time the animals were beginning to explore the entire exhibit.

OBSERVED BEHAVIOR

During the first seven days outside, all family members preferred to climb across the wire side and roof or to jump on the dead branches. The adult female emitted drawn out continuous high-pitched calls in all directions each time she emerged from the indoor quarters. The two juvenile males played outside much more often than the adults. By the tenth day, the fifty-one-day-old infant had had enough of the security of her father's back and began to spend much more time outside exploring with her brothers. They were, at this point, tasting everything they touched. Pine needles, feathers, bits of mulch and other novelty items were brought inside the house. Visitors who approached the plexiglass were treated to the immediate apparition of the curious young primates only inches away. In contrast, the adult male continued to be satisfied with only very brief jaunts outside for forty-one days. After 29 June, 1983, he began to spend more time outside, especially when the rest of his family was inside.

Despite the fact that all of the animals are captive born, they have rapidly assumed behaviors of wild Callimicos. * High-pitched calls that gradually fall in pitch and carry for some distance are common. Powerful hind limbs are used to make skillful jumps as far as four meters across. On the 27th day outside, the young males were seen mobbing an unsuspecting rat who had found its way through the so-called rat-proofing! On 5 July, the 47th day outside, one of the young males was observed trying to catch a skink. Thirty days later, the same male was seen eating an anole (small lizard).

In the morning, the animals like to hang from the roof, exposing their well-furred bellies to the early sunshine. Even the young animals are very hairy abdominally (as well as elsewhere), unlike young Callimicos pictured in various texts. During the hottest hours of the day, the animals sprawl on branches or retreat to the cooler indoor area. No cold symptoms have occurred in response to the temperature changes between the two areas.

Because they have access to privacy, the Callimicos are much less excitable than ever before. Even when large groups of loud children rapidly approach the exhibit, the primates respond with mild curiosity. Beginning in August, the adult female displayed the distended abdomen and soggy tail of impending motherhood. Considering their more relaxed attitudes, another successful birth seems more likely than ever before.

*Brasileira de Ciencias, Academia. Ecology and Behavior of Neotropical Primates. Rio de Janeiro, 1981, Volume 1.

**Hershkovitz, P. Living New World Monkeys (Platyrrhini). The University of Chicago Press, 1977, Volume 1.



TALKING ZOOKEEPER BLUES (REPRISE)



Well, here we are at another Convention;
It's a good idea, it's a good invention
To attend these annual meetings whenever you can.
When the backbone of North America's Zoos
Get together exchanging news,
To make it every year is a super plan!
(It's lots of fun attending them,
but have you ever tried organizing one?)

This isn't really a 'Talking Blues'
It's just me rambling on about zoos
In general, about the animals and the people you'll find there.
I wrote this simple chorus
We can all join in and let the world know Keepers Care!

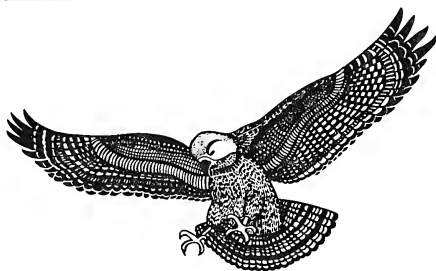
Working for a common goal, it's in your heart, it's in your soul,
Zoo keepers everywhere,
Dedicated Keepers, Keepers Care!

The proper care and maintenance of wild animals in captivity
Is the principle activity with which we spend our time,
And we all suffer some frustration
In our chosen occupation,
In different seasons, for different reasons,
But I'll bet yours are the same as mine.
(Animals that don't feed, species that won't breed,
Public who don't read, and people who won't heed the Keepers'
Advice and suggestions...)

Working for a common goal, it's in your heart, it's in your soul,
Zookeepers everywhere
Dedicated Keepers, Keepers Care!

Oliver M. Claffey
Metro Toronto Zoo
Lyrics and Music
© 1983

ZOOKEEPING GIRL



*There's a rare bird living in the world today,
She works hard for survival in a very special way;
So fragile, so strong, she's so many things,
And how I love to watch a rare bird use her wings,
I love you Zookeeping Girl.*

*It's not always easy doing what she has to do,
But she doesn't need a shove, it's a labour of love,
She understands just what Nature is going through,
She's the kind of girl I've been dreaming of,
How I love you Zookeeping Girl.*

*It's not hard to find what's on my mind,
It hasn't changed since the world began,
Let me be your Zookeeping man.*

*You may be in Utica or Abilene,
Topeka, Toronto, Chicago or out along the coasts,
From Canada to Florida and inbetween (Philadelphia)
The working girl who I admire the most,
How I love you Zookeeping Girl.*

*There's a rare bird living in the world today,
She's a very special lady,
Stole my heart away,
I love you Zookeeping Girl.*

*I love you and zookeeping,
Oh, how my heart is leaping,
I need you Zookeeping Girl.*

There's a rare bird living in the world today.

*Oliver M. Claffey
Metro Toronto Zoo
Lyrics and Music
© 1983*

Legislative News

*Compiled by Kevin Conway
Legislative Coordinator*

CHANGES PROPOSED IN LISTING PROCEDURES

Proposed changes in the procedures to list species as Endangered or Threatened and to designate their Critical Habitat have been published jointly by the Fish and Wildlife Service (Dept. of Interior) and National Marine Fisheries Service (Dept. of Commerce). The proposal would amend Federal regulations (50 CFR 424) to comply with the Endangered Species Act Amendments of 1982.

Most of the changes are intended to streamline the listing process. Only scientific information is to be considered during listing decisions, and nonbiological factors are not allowed to affect such decisions. After a petition to list, reclassify, or delist a species is received, the Secretary of the Interior (or Commerce where applicable) must act "to the maximum extent practicable" within 90 days to determine whether or not it contains substantial information that the petitioned action may be warranted. Within a year of receiving a "substantial" petition, the Secretary must publish a proposed rule, a notice that the petition is not warranted, or a notice that the action is warranted but that other listing actions preclude the preparation of a proposal within the specified time period. An extension of one year is allowed, but only if the Secretary can demonstrate progress on other listings. Final action on listing or Critical Habitat must now be taken within one year of the proposal, instead of two years as previously required. A 6-month extension may be granted if there is substantial disagreement among specialists on the biological data. Extensions are not permissible to allow additional economic or other analysis relating to Critical Habitat designations.

The 1982 Amendments restate the general requirement of concurrent listing and Critical Habitat designations, but authorize listing without the latter in certain circumstances. If a Critical Habitat designation is found "not prudent," the listing can become final at any time within the required period. When data indicate that a prompt listing is essential for conservation of a species but the analysis necessary to designate Critical Habitat has not been completed, the listing must be made final within the required period without the Critical Habitat designation; the Critical Habitat segment of the proposal should then be completed separately as soon as possible within an additional year.

Among other changes in the proposed rule are a consolidation of the requirements for public hearings and public meetings, and a requirement for written explanations of any rules adopted over the objections of a State or any not adopted when petitioned by a State.

*---Endangered Species Technical Bulletin
Vol. VII, No. 9, September 1983*

BALD EAGLE MAKING STRONG COMEBACK

The bald eagle, officially endangered in 43 states and threatened in five others, is showing strong signs of recovery. The National Wildlife Federation's 1983 Bald Eagle Survey, taken from Jan. 2-17, counted 12,098 bald eagles in 46 states. They are plentiful in Alaska and there are none in Hawaii.

The count, about the same as last year's and up from the 9,815 in 1979, is considered the most complete midwinter count available. This year's mild winter apparently resulted in higher than normal counts in the north and lower numbers in the south. NWF raptor biologist Brian Millsap, co-ordinator of the survey, said, "During mild winters, bald eagles seem to overwinter farther north and remain more dispersed than during cold winters."

Increases were noted in Michigan, Minnesota, Montana, North Dakota and Wisconsin with decreases in Alabama, Arkansas, Florida and Texas. The largest count was in Washington with 1,158, followed by Utah's 1,042, Florida's 684 and Idaho's 644.

---ECOLOGY USA
September 26, 1983

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED			THREATENED			SPECIES* TOTAL	SPECIES HAVING PLANS
	U.S. Only	U.S. & Foreign	Foreign Only	U.S. Only	U.S. & Foreign	Foreign Only		
Mammals	15	18	223	3	0	22	281	19
Birds	52	14	144	3	0	0	213	40
Reptiles	8	6	55	8	4	12	98	6
Amphibians	5	0	8	3	0	0	16	3
Fishes	29	2	11	12	0	0	56	23
Snails	3	0	1	5	0	0	9	5
Clams	23	0	2	0	0	0	25	1
Crustaceans	2	0	0	1	0	0	3	1
Insects	7	0	0	4	2	0	13	3
Plants	55	2	0	9	1	2	69	9
TOTAL	199	44	444	48	7	36	783	110**

* Separate populations of a species, listed both as Endangered and Threatened, are tallied twice. Species which are thus accounted for are the gray wolf, bald eagle, American alligator, green sea turtle, and Olive ridley sea turtle.

** More than one species may be covered by some plans.

Number of species currently proposed for listing: 21 animals
17 plants

Number of Critical Habitats determined: 55

Number of Recovery Plans approved: 99

Number of Cooperative Agreements signed with States: 38 fish & wildlife
11 plants

September 2, 1983

INTERNATIONAL FOODS COMPANY

offers
a full line of
PROVEN

Quality products for your feeding program



INTERNATIONAL FOODS COMPANY

P.O. Box 29345 • Lincoln, NE 68529

Call Collect: (402) 466-8271

BENEFICIAL ASPECTS OF PHOTOGRAPHIC DOCUMENTATION
OF CAPTIVE WILDLIFE BY ANIMAL KEEPERS

By
Milton H. Tierney, Jr.
Large Mammals Unit
National Zoological Park
Washington, D.C.

(Editor's Note: Due to space limitations and our inability to utilize color photographs in AKF, we regret that we were not able to include all of the photographs Mr. Tierney used as illustrations for his paper. We have selected several which were suitable for our production capabilities and which illustrated the points made in the paper and have included them with the text.)

INTRODUCTION

With the increased concern for the environment, zoos and parks are taking a more active role in conducting research on behavior and propagation of the various species under their care. Because of this, new keepers are no longer required to perform just janitorial services for the animals. Today's keepers must conduct research on behavior, nutrition and animal husbandry.

This paper is only to give examples of various topics that photography can be conducive to the research that is conducted by keepers. The use and suggestions of various photographic equipment to be employed can only be on a case by case basis, which is beyond the scope of this paper. The main theme is to stimulate new ideas by keepers for the benefit of the animals under their care.

ACKNOWLEDGEMENTS

I would like to express my gratitude to Kay Kenyon, Sharon Barry, Morna Holden and to Wy Holden for their many helpful suggestions and assistance. Also especially to my wife, Vickie who has helped immensely with the editing and typing of this manuscript.

With man's ever-increasing encroachment of civilization on natural habitats and pollution on all levels of our environment, many species of animals are fast becoming endangered or extinct. This is why zoos today are taking an active part in the survival of many species. For many species their continued existence depends on being in captivity.

Animal keepers have the unique experience of being exposed every day to the lives of animals that are in captivity. Careful observation of animals under the keeper's care can enhance understanding and insight into the lives of those species. Keepers, having many years of hands-on experience, know how a particular species and individuals within that species will react to new and different stimuli if placed inside the cage or enclosure. Knowledge of the behavior modification in captivity can contribute to the future benefit and survival of those species. With this knowledge, keepers should use all means to educate the general public that all animals, no matter what evolutionary level they are on, are important to the survival of other species, including man.

To increase their knowledge and understanding of the animal world, today's keepers are taking up different tools in conjunction with the traditional rake and shovel. These tools are helpful to the welfare and propagation of our captive wildlife; to name a few: genetics, zoology, chemistry, parasitology, sociobiology, ecology, botany and photography. Scientists and researchers have found that the use of photography in an indispensable

tool in their work. It has become one of the greatest communications devices ever invented. It can and does touch all aspects of our lives and the lives of the animals as well. Photography can aid keepers doing research and help the professional research staff in the zoo communicate better with others. If one keeper in a zoo, park or aquaria takes up a camera, the understanding of the animal kingdom as a whole, both captive and free, can be increased 10-20%.

There are numerous photographic possibilities that a keeper can use. However, to name them all and go into any depth is beyond the scope of this paper and would not do them justice. One possibility where photography can be applied is in the identification of individual animals. In a particular species like the zebra that has distinct stripe markings, the stripes can be compared with others (Fig. 1). The stripe pattern of this species are individualistic like fingerprints. The markings from scapula to the humerus (circled area) can be easily distinguished. (Figs. 1A & 1B)

Horn growth in some species can be another way to identify one individual animal from another. Bongos have a particular horn shape that is characteristic to each. This characteristic shape makes it possible to distinguish one individual from another at a long distance. Not only can horn growth be used to identify individuals, it can also be used for field research. By studying the horn growth of captive animals, field researchers can use this knowledge to help approximate the age of an animal in the wild.

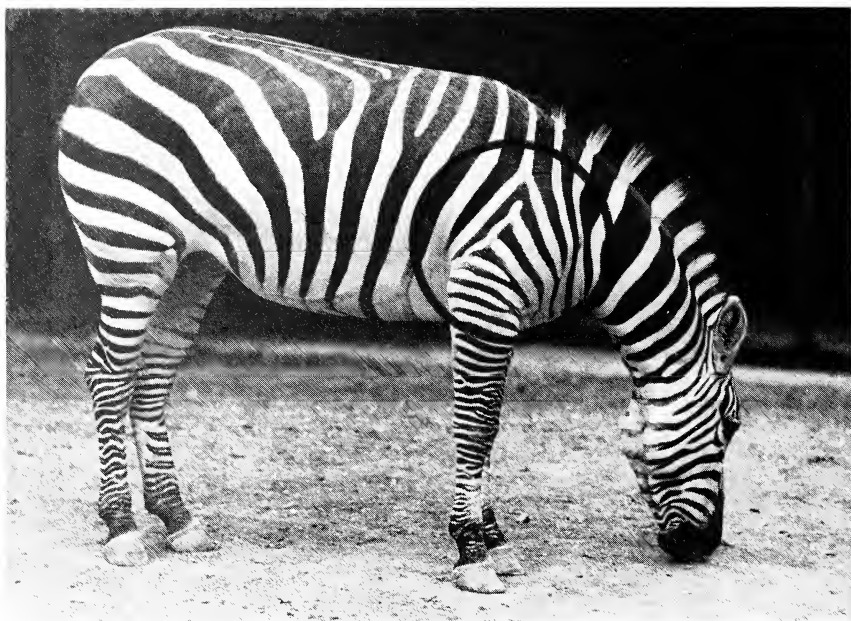


Figure 1A

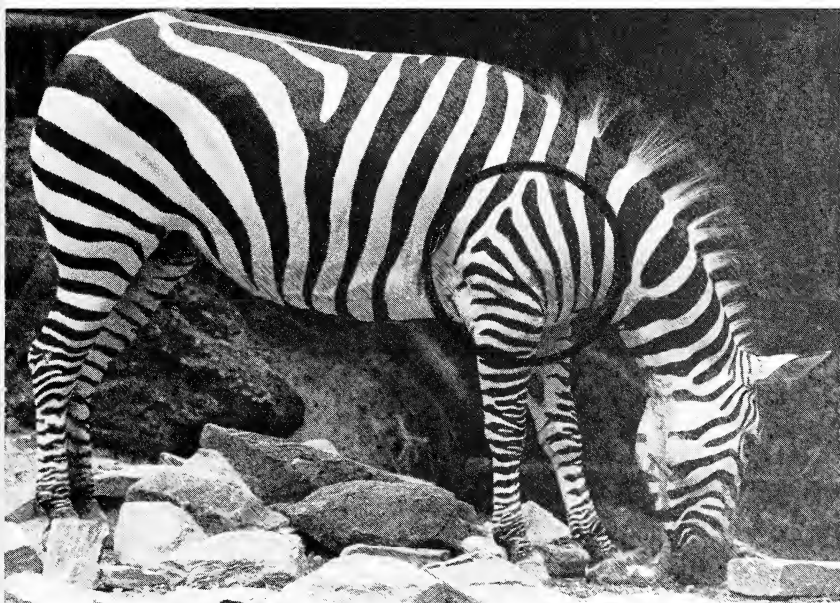


Figure 1B

The growth of a young animal, particularly males, to an adult will show a growth of muscle and fatty tissue that is characteristic of their species. Development of these areas is usually associated with territory or breeding behavior. For example, a ten-month-old male bongo will still show the same color and neck size of a female bongo of comparable age. When the male matures, he will develop the massive neck and color change characteristics of male bongo. Besides this change, a maturing male bongo will also display color changes from reddish-brown to black on the neck, chest and legs. Another species in which the color changes could prove important for research is in the white-cheeked gibbon.

Photographing the birth of an animal (Fig. 2) can aid veterinarians, keepers, researchers and others by showing the normal or abnormal delivery of the infant. Also the behavior of other animals toward the newborn can be recorded to help researchers understand more completely the social order of the species.

Different behavior displays of an animal may only last a few minutes or seconds. If the staff photographer is solely relied upon, he or she will most likely arrive too late to record what is needed. One of the main problems for a zoo photographer is time. It takes time to record a particular behavior and the staff photographer may have neither the time nor patience to observe for hours or weeks. Since the keeper is already in the general area, he or she is in the best position to photograph the needed behavior.



Figure 2

Breeding and social behavior have been photographed extensively in the past, but aggression (fighting) between individuals can be studied further. By freezing the action with a camera (Figs. 3 & 4), keeper and researcher can study the body movements of a particular species.

Aggression or the appearance of aggression can appear at any moment. Instead of aggression, it may turn out, the two animals may be showing a possible form of play in adults. This behavior could be to reinforce the dominance of an individual over the other.

The form of play can be between two individuals of the same species or between two individuals of different species. The play between different species seen by the keeper is most likely between the keeper and the animal under his or her care. Keeper and animal interaction is always interesting to observe, especially if there is a rapport between the two. When the individual animal will allow close observation or contact with the keeper, this makes examining or moving the animal a lot simpler and less stressful for the animal.

The most common keeper-animal interaction seen by the visitor will be between the keeper and elephants. The keeper controlling the movements of the elephant shows and reinforces his dominance over the animal. With this understanding, it makes it possible for keeper and veterinarian to examine and correct any physical problem that may occur (example: foot care). By photographing the medical problems, such as on the elephant's foot, progress in the area can be shown. Not only will recording such problems on film aid the veterinarian staff, but also will help instruct new keepers on proper maintenance of animals.

Another photographic possibility for keepers to record behavior is in the area of apparent psychological problems that an animal may be experiencing. Since the keeper has daily contact with the animal, he learns what temperament each individual displays. Knowing their animals, the keepers will pick up any abnormal behavior more quickly. One example of such behavior



Figure 3

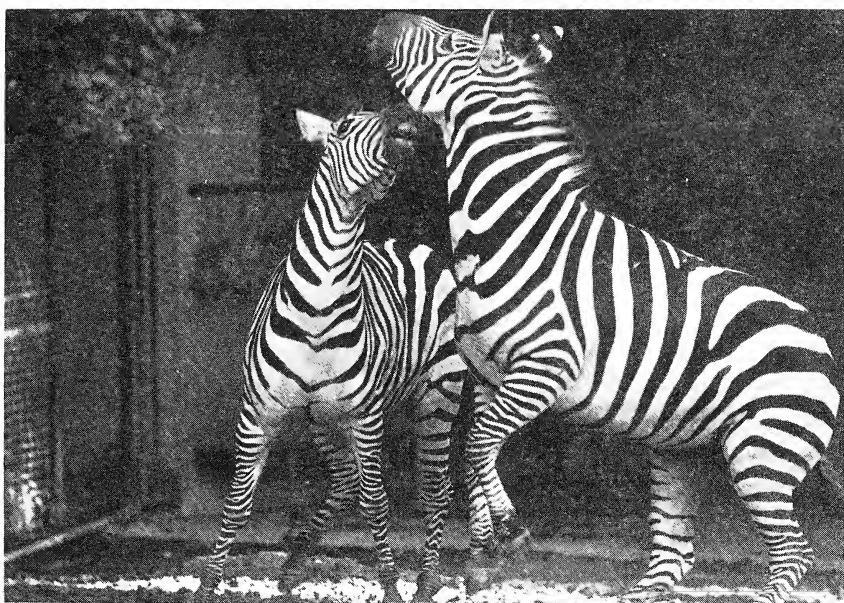


Figure 4

BENEFICIAL ASPECTS OF PHOTOGRAPHIC DOCUMENTATION OF CAPTIVE WILDLIFE
BY ANIMAL KEEPERS, Continued

recorded photographically at NZP was an appearance of depression in the Giant Panda following the death of her offspring. Photographs show her cuddling an inanimate object, in this case an apple, as if it were an infant.

To mention other possibilities, one might photograph the nesting of birds in the collection or record the veterinary staff working on sick or injured animals. Any safety problem such as visitors feeding animals can also be recorded on film.

Genetic problems among the animal collection is an area that should be documented for future reference and research by veterinarians, researchers and keepers. Figures 5 & 6 show a 24-hour-old Eld's deer fawn with rounded ears and a shorter muzzle that results from inbreeding.

With today's technology, it has become a lot simpler to operate a camera that it was two or three decades ago. Still, movie and video cameras have become smaller and easier to operate. Anyone with some basic knowledge of photography can take photographs from microorganisms to a scenic mountain range. Easiest and most versatile is the 35mm single lens reflex which can be equipped with a motor drive for faster action and with different focal length lenses from 9mm to 5000mm. A zoom lens and an electric flash attached to a camera will be all the basic equipment needed to get the job done.

Keepers have a unique opportunity to document valuable behavior information with photography---behavior information that is desperately needed to help understand our animal world. It has only been recently, in the

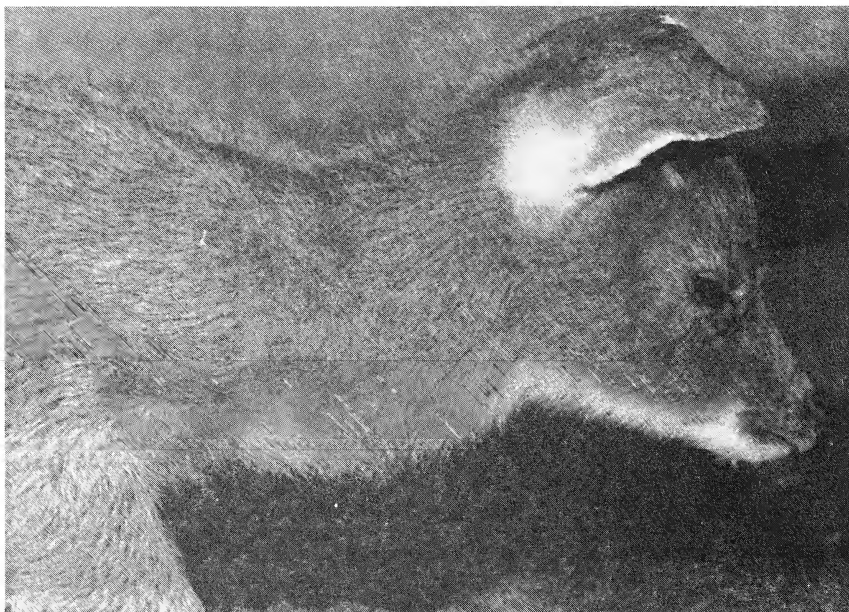


Figure 5

BENEFICIAL ASPECTS OF PHOTOGRAPHIC DOCUMENTATION OF CAPTIVE WILDLIFE
BY ANIMAL KEEPERS, *Continued*

past century, that the study of animal behavior has been taken in earnest. With each passing day we learn more about the potential benefit of each species. Photography has shown it can contribute and support vast amounts of knowledge by researcher and scientist.

Animal keepers today can and do want to contribute more knowledge toward animal welfare and survival. With numerous avenues open to our zoos, parks and aquaria, keepers can help researchers and other keepers by using photography as a tool.

Photographic documentation by keepers of the animals in our zoos and parks should be explored by the administrative staff as well as by keepers for the benefit of our captive wildlife.

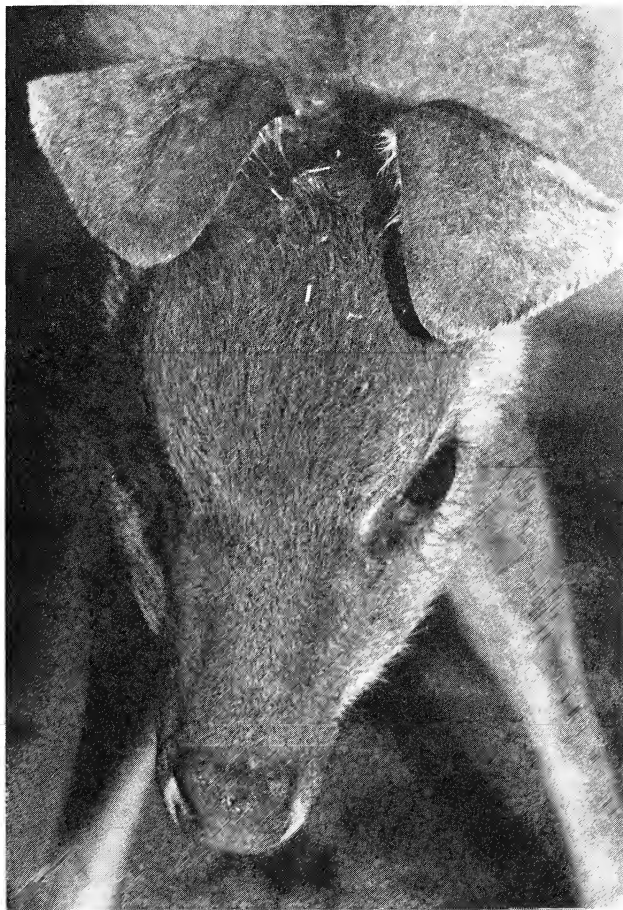


Figure 6

BENEFICIAL ASPECTS OF PHOTOGRAPHIC DOCUMENTATION OF CAPTIVE WILDLIFE
BY ANIMAL KEEPERS, Continued

BIBLIOGRAPHY

- Dunton, Sam. 1957. Hold that tiger! Greenberg, New York. 188pp.
- Garrison, Ronald with John Gray. 1972. Secrets of zoo photography. Doubleday, Garden City, New York. 127 pp.
- Hosking, Eric and John Gooders. 1976. Wildlife photography: a field guide. Hutchinson, Tarrytown, New York. 181 pp.
- Hosking, Eric with David MacDonnell. 1979. A passion for birds: fifty years of photographing wildlife. Coward, McCann & Geoghegan, New York. 224 pp.
- Stagg, Mildred. 1975. Animal and pet photography simplified. Amphoto, Garden City, New York. 96 pp.
- Freeman, Michael. 1981. The Complete Book of Wildlife and Nature Photography. Simon & Schuster, New York, NY. 224 pp.
- Marchington, John and Anthony Clat. 1974. An introduction to bird and wildlife photography: in still and in movie. Transatlantic, Central Islip, New York.
- _____. 1966. The techniques of wildlife cinematography. Focal Press, New York. 222 pp.

Information Please

We've recently acquired 5.3 pygmy marmosets and have had twins born to two females within the last few months. We would appreciate any information regarding general husbandry and housing with particular emphasis on gestation, diet, exhibit temperature and humidity ranges, and group dynamics. Please contact keepers Donna Gutekunst or Mary Willis c/o Primate Propagation Center, P.O. Box 551, San Diego Zoo, San Diego, CA 92112.

Information is being sought for the writing of a research paper on the behavior, reproduction and physiology of *Paguma larvata*. Any Zoos and/or individuals having experience with this species either in captivity or in the wild are asked to correspond. Sources of information will be appreciated and acknowledged. Contact Kathleen Schneider, 15270 Westover Road, Elm Grove, WI 53122. (414) 786-8609.

Anyone having had experience treating diabetes in leopards and other large cats is asked to send any pertinent information to: Verona Barr, Miller Park Zoo, 1020 S. Morris, Bloomington, IL 61701.

MATERNAL BEHAVIOUR AND INFANT DEVELOPMENT
OF THE LOWLAND GORILLAS AT METRO TORONTO ZOO

By
Marilyn Cole and Linda Ervine
Keepers, Metro Toronto Zoo
Toronto, Canada



Our adult group is comprised of five females--Amanda, Julia, Caroline, Josephine and Samantha, all now about twelve years of age, and having been in our collection since the age of approximately three. You will be hearing more about the last three females later in this paper. Our two males, Charlie and Barney, are about the same age, and so far there has been no active aggression against one another, even though Charlie has now reached the status of Silverback. They each have preferred females, or rather perhaps I should say that the females have their preferred male!

Our facilities include an indoor exhibit in an approximate C-shape, with concrete floor, pool, climbing apparatus, vertical poles, mesh roof and front viewing windows with access to a holding comprised of ten individual cages. Doors may be left open or shut between each compartment, each of which has a sleeping platform, automatic waterer and skylight. The outdoor exhibit is weld mesh construction, with vertical poles for support. Ropes, horizontal poles and a pool provide recreation for the gorillas, as well as visual barriers, and they enjoy the grass surface.

My section of this paper focuses on the two females Josephine and Samantha, and their offspring.

Our gorillas had been sexually active for many years, even as youngsters taking an interest not only in each other, but also keepers and in 1980 we suspected that a few might be pregnant. However, urine samples did not determine accurately just how many, and all we could do was keep a close observation for symptoms of pregnancy. Josephine had indicated a strong dislike for dry monkey chow for some months, accepting it only when it had been soaked with hot water into a mush with a little honey added. Both she and Samantha developed large stomachs and breasts, and it was not surprising to see Sam go into labor on 4 November, 1980. We allowed her to remain with the group, and after an easy two-hour labor, she squatted and gave birth to a female infant, later named Natasha. Unfortunately, the group harassed Sam too much, and the decision was made to separate her and Josephine from the rest of the gorillas. Natasha was observed in a nursing position just six hours after birth, but no confirmed sightings were actually made until two days of age, the same time Josephine gave birth. However, in contrast, Jo's labor was a very long, painful 6½ hours, ending in a breech presentation. Both mothers cleaned their infants well and ate the placenta, and both cared for their infants even though they had never had an opportunity to observe such behavior, other than perhaps as youngsters while still with their mothers.

By the time Jo's infant was three days old, she was producing more milk than Tabitha could drink, and it was necessary to tranquilize Jo to relieve the pressure so that she could continue to nurse her infant in comfort. After this procedure, Jo was a model mother and did a wonderful job of rearing Tabitha, and even while playing with Samantha, she was careful of her infant. In contrast, Samantha's behavior became quite erratic; as early as five days old, Sam carried her infant facing outwards and upside down. At age 12 days, the baby was draped over Sam's

MATERNAL BEHAVIOUR AND INFANT DEVELOPMENT OF THE LOWLAND GORILLAS
AT METRO TORONTO ZOO, Continued

arm, and then on her head and shoulders, even though Natasha was much too young to cling properly. Sam mounted her infant when disturbed, and began leaving Natasha on the floor at age 15 days. The fact that Samantha was suffering from a severe cold may have been a contributing factor to her discomfort with her infant, but whatever the reason, by the time Natasha was 19 days old, Sam had had enough. She began dragging the infant across the floor, forcing it to cling while she climbed to the ceiling of the exhibit, and eventually abandoned it altogether. We were able to distract Sam long enough to grab the infant, and Natasha was whisked away to the veterinarian's initial care and subsequently placed in a incubator. And so began the long nights for us of patient tending and bottle feeding.

Several formulas were tried until goat's milk was settled on, and her weight steadily increased. Natasha was taken out of the incubator frequently and held by her keeper, either in a baby chest carrier, or in the lap, and she was also taken for visits to the other gorillas. At age 34 days, she was noticing her surroundings; at age 5½ weeks she was standing with assistance. At age 7 weeks she was able to turn herself from her front to her back. She was then taken out of the incubator permanently and left in a crib with a top on it at night. At age 7½ weeks she was reaching for specific objects and cut her first two incisors at just under two months. Shortly thereafter, she was dragging herself along the carpet, but it wasn't until 26 February, at age 3½ months, that she was able to walk. From then on in, there was no holding her back, and nothing was safe from her scrutiny any longer.

Meanwhile, Josephine's baby, Tabitha, was in advance of Natasha's progress by a short time period, as Jo made certain that she got lots of exercise. Tabitha was able to sit without wobbling at age 2½ months, and walked considerably smoother than Natasha did. She also began taking solid food dropped by her mother much easier than Natasha did. And so it was with great alarm that we watched Tabitha lose interest in food and her surroundings, preferring to cling closely to her mother with eyes closed.

Although blood tests indicated an infection, antibiotics did not clear it up. Finally, on 24 July, 1981, nine months after her birth, Tabitha began to convulse. Thanks to the cooperation of local medical authorities, she was rushed to the Hospital for Sick Children, where a CAT scan was done. A brain abscess was diagnosed, and a neurosurgeon performed the surgery which saved her life. The organism found was similar to that which causes meningitis in children. As a result of the particle of skull removed, Tabitha was outfitted with a special hockey helmet, and joined Natasha in the nursery. To say that Natasha was not thrilled is an understatement. This was a true case of sibling jealousy, and had to be dealt with firmly, as Tabitha was paralyzed on the left side as a result of the surgery. And because of the paralysis, she beat her chest with her right hand only. Shortly thereafter, Natasha also began beating her chest with one hand.

There remains some doubt as to whether the memory of Tabitha's early socialization with her mother was wiped out as a result of her surgery, as she appeared not to recognize her mother when brought for a visit a short time later, and in fact she was rather nervous of Josephine. In marked contrast, Jo has never forgotten her baby, and this is exemplified in her threatening a visiting dignitary who picked Tabitha up, a full year after having been separated from her infant.

MATERNAL BEHAVIOUR AND INFANT DEVELOPMENT OF THE LOWLAND GORILLAS
AT METRO TORONTO ZOO, Continued

Gradually, with the help of physiotherapy, Tabitha regained the use of her left side and was then a match for Natasha's boisterous play. They are now the best of friends, and at three years of age weigh in at 60 pounds apiece--quite an armload.

To cope with the problems of boredom, we have provided our youngsters with various toys, as well as materials such as straw, wood wool, shavings, hay, browse, grains, wool fleeces, ropes, rubber tubs, plastic drums, tires, and paper and burlap bags. In addition, we have interested them in finger-painting, and they became budding artists for awhile until the novelty wore off. And to add one more dimension to their day, American Sign Language is taught to them when a food item is offered.

CAROLINE'S PREGNANCY

When Caroline began cycling regularly in 1976, she mated frequently with both males, but since 1982 has only been seen mating with Barney. Conception likely occurred on or about 29 August, 1982, although no breeding was observed.

She began refusing foods which she normally liked at the end of September and by mid-October, seemed more depressed than usual. Four positive pregnancy tests, the Horner's UCG-Beta Slide types, were obtained between 13 December, 1982 and 6 January, 1983. After that, results were negative.

During her pregnancy, she was observed mating with Barney once in February and again in March. Late in her pregnancy, she was very fussy about food, drank more water, developed bald patches on her upper abdomen, and spent most of her time resting. One morning she was shivering, although the air was warm. Her weight gain was noticeable, but not great. On 11 May, she was observed squeezing and licking both nipples, which had never been seen previously.

During the last few months of pregnancy, she was separated from Barney at night with a space under the door only large enough for her to fit through. She spent some night with him and others by herself.

CAROLINE'S BABY

The birth occurred early on the morning of 18 May, 1982, after a probable gestation period of 262 days. Caroline was found holding the newborn, apparently female baby at 7:20 a.m. The baby was clean but moist, its eyes were still closed, and the cord was broken off at its body. It had several unpigmented areas on its hand and feet, a trait probably inherited from Caroline.

Caroline was nervous and still bleeding. She had already passed the placenta and eaten it. The baby had several small cuts on its head and neck, indicating that Caroline may have helped pull it out. When she entered Barney's cage from her own where the birth had taken place, she protected the baby and threatened him away. Although she stayed in a separate cage most of the time, she wouldn't shift unless accompanied by Barney. The rest of the group was put out into the display.

Caroline treated the baby fairly well except if upset or frightened at which times she would hold it in awkward positions, making it cry. She also mouthed it briefly. Late that afternoon, Caroline grew more upset,

MATERNAL BEHAVIOUR AND INFANT DEVELOPMENT OF THE LOWLAND GORILLAS AT THE METRO TORONTO ZOO, *Continued*

perhaps due to her isolation. She put the baby's arm in her mouth and climbed up to look out the skylight, nearly dropping it on the way down. She repeated this trick several times, sometimes forcing the baby to cling unaided. She also mounted it again and briefly left it on the floor alone. She was more settled after the rest of the group was brought in for the night.

Nursing was first seen at 4:00 a.m. the next day, and increased in frequency thereafter. By the end of the first week, nursing was occurring at least 14 times in 24 hours. Caroline kept the baby mostly in a ventral/ventral position for the first week, except when upset about the group leaving the holding. Barney managed to steal the baby once during the night, but she immediately retrieved it.

When the baby reached ten days of age, Caroline and Barney were let into the display together for the first time. He ignored them at first, but when the baby cried he became interested, poked at it, and threw Caroline around trying to get to the baby. After that, Barney was kept separated.

Caroline then began what seemed to be a training program to accustom the baby to progressively less maternal care. She held it increasingly in a ventral/dorsal position and left it alone on the floor. At first she would return when it cried, but later she ignored it and it got used to being alone, and didn't cry as much. She held it away from her and actively prevented it from grasping her hair.

By two weeks of age, the baby was rarely held during the day, but still was at night. Also, at this age it was looking around and trying to crawl. An attempt at introducing Samantha resulted in a big fight with the baby being ignored. Meanwhile, Josephine, who was pregnant again, was being closely monitored.

JOSEPHINE'S PREGNANCY AND BIRTH

On 8 June, 1983, after a probable gestation of about 252 days, Josephine gave birth around 7:00 p.m. to a stillborn, male infant following about two and one-half hours of labor. The baby's face was exposed for at least ten minutes before parturition was completed. It was also facing the wrong way. These factors may have contributed to its suffocation during the birth process, as well as the large size of the baby; its weight was 2.54 kg. on autopsy.

In retrospect, a few weeks after she conceived, Josephine began refusing some food items. Pregnancy tests varied between positive and negative throughout the gestation period. Other signs of pregnancy which were seen included depression and lethargy, shivering, aggression toward anyone other than her regular keepers, loose stool, and bedwetting at night. Lactation, which started with her first pregnancy, ceased for only a few months and started again in March 1983.

Her weight gain was noticeably greater than it had been with Tabitha which led us to believe that her due date might have been sooner. She also ate regurgitated food much more frequently during the pregnancy. She was seen mating several times in February with Charlie, likely the baby's father. They were probably stimulated by the presence of one of their favorite visitors.

MATERNAL BEHAVIOR AND INFANT DEVELOPMENT OF THE LOWLAND GORILLAS
AT METRO TORONTO ZOO, Continued

Josephine cared for the dead infant as though it were alive, and only gradually lost interest. She did not leave it alone long enough to be removed until four days later. Although the baby's death was certainly a tragedy, there were happy consequences for Caroline's baby.

On 16 June, when Caroline's baby was four weeks old, Josephine was re-introduced in the inside display. Initially, Caroline mostly ignored her and was more attentive to the baby, but not for long. At five weeks, the baby was making good progress at crawling after her frequently departing mother. Also at this age, Caroline mostly stopped holding her while sleeping at night.

On 4 July, when the baby was six weeks of age, Josephine picked her up and groomed her for ten minutes while Caroline slept. Caroline was not very upset when she woke up, and just retrieved the baby. Since that time, Josephine has played a major role in rearing the baby. Occasionally she is reluctant to give up the baby, but mostly she hands her over whenever Caroline approaches. Caroline has continued to adequately nurse the baby, but seldom has much interest in playing with or cuddling her. Caroline is especially bad while being fed, usually ignoring the baby completely unless her screaming becomes unbearable.

Josephine frequently plays with and manipulates the baby in various positions, ensuring that she gets necessary exercise. Her only bad habit is the inordinate amount of time she spends playing with the baby's nipples. She usually carries her on her back when moving from place to place, whereas Caroline will carry her held out by one arm.

The baby's first two lower incisors erupted at two months of age, and interest in food soon followed. She learned quickly to accept food from keepers. At four months she has all eight incisors in, but is still just tasting and chewing on food items, and is not actually eating much.

She has had some hair loss on her head from her habit of grasping it when feeling insecure. At almost three months of age, her weight is 3.07 kg. when she was removed briefly to be checked. Soon after, she began walking with her body off the ground, and at four months, she was walking quite well and had given up crawling.

CONCLUSION

Throughout the times of worry and sadness, the frustration and hard work, the calendar-watching and the midnight shifts, it's the ones who survive and thrive who make it all worthwhile.

ACKNOWLEDGEMENTS

We would like to thank all the keepers and other zoo staff and associates whose careful notes, photography and videotaping helped to make this presentation possible.



THE BIRTH AND DEVELOPMENT OF A
LAR OR WHITE HANDED GIBBON

By
Rachel Roberts, Zookeeper 1
Metrozoo, Miami, FL

INTRODUCTION

The following information has been compiled for the purpose of being informative as well as being available for future reference. After reading this paper hopefully you will have a better understanding of the Lar Gibbon, while gaining insight to the case history of the breeding pair at the Metrozoo. This paper exemplifies a case where the dam and the sire came from totally different backgrounds and within a years' time produced a healthy offspring which was mother-reared. The environment in which their infant developed was different from that of any previous offspring of the dam or the sire.

NATURAL HISTORY

The family *Hylobatidae* consists of 3 genera and about 9 species. The genus *Hylobates* is made up of some 7 species of gibbon within 3 subgenera; *Hylobates*, *Bunopithecus*, and *Brachitanytes*. Linnaeus first classified the White Handed Gibbon as *Homo lar* in 1771. Modern classification refers to them as *Hylobates lar*.

The distribution of the Lar Gibbon is Malay, Tenasserim, Burma-east of the Salween River, Laos-west of the Mekong River, and southwestern Yunnan. It is thought that two races occur in Thailand. It seems that water serves as a zoogeographic barrier for gibbons and that rivers form the boundaries of species.

The Lar Gibbons are asexually dimorphic. They range in color from a dark chocolate brown to a light blond, with coat color remaining the same throughout the life of the animal. The coat is so dense that even in the heaviest rain they have only to shake the body to become nearly dry. As their name implies, they have white hairs covering the hands, as well as on the tops of the feet and a ring around the face.

Lar Gibbons eat primarily fruit in the wild for which they are equipped with a large intestinal tract. They require large amounts of water as well as the security of tall trees. This allows them to inhabit a variety of forest types.

To me their most important attribute is the morning ritual of the territorial call, where the whole family will usually join in. It is said that in the wild the Lar Gibbons begin calling early in the morning but rarely call after 10:30 a.m. Oddly enough this coincides with zoo hours, so that the first rush of patrons gets the best concert of the day.

A single infant is born after a gestation period of about 7½ months. The infant stays with the mother for up to a year and may continue to nurse up to 2 years. The female may breed at two-year intervals and a family group may consist of up to four offspring and the parents. Mature offspring are usually ostracized from the family group at 6 to 8 years of age, which often leads them to finding their own mate and the cycle starts over again.

Information on the natural history of the Lar Gibbon has been taken from Lekagul and McNeely (1977).

BIRTH AND DEVELOPMENT OF A LAR OR WHITE HANDED GIBBON, Continued

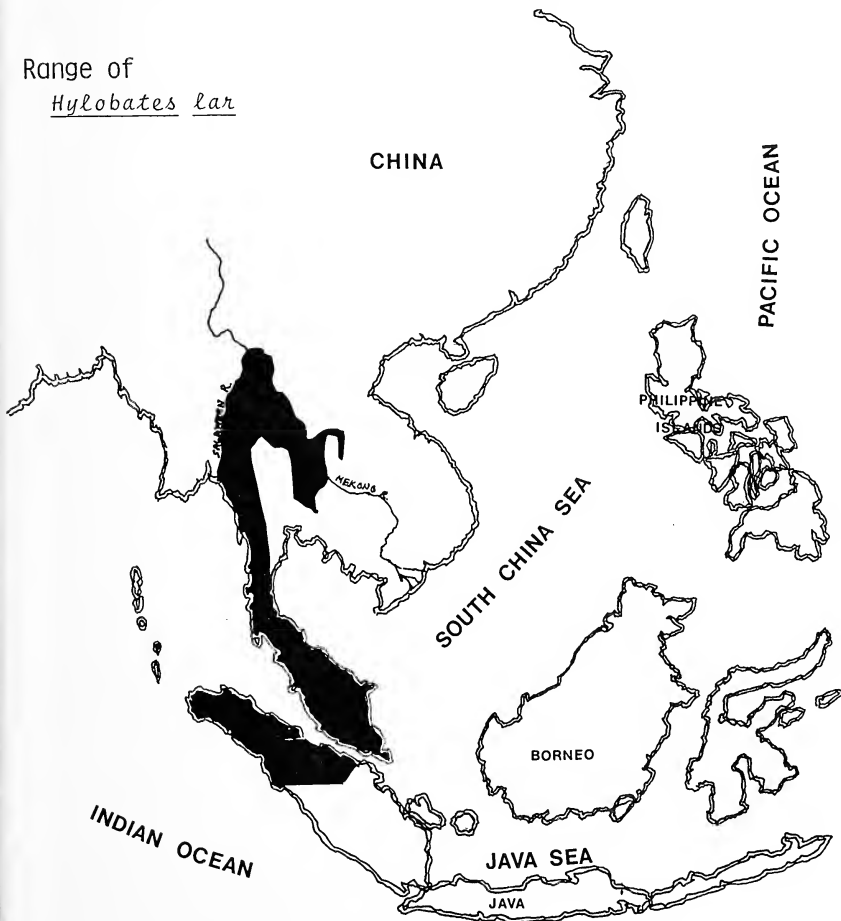
PRE-ZOO HISTORY OF DAM AND 0.2 OFFSPRING

The adult female and her two previous offspring came from a different setting than most zoo animals are accustomed to. Although they did have contact with people, it isn't the same kind of contact zoo animals receive. Breeding facilities for research animals are most likely what a zoo would be like without the public. The animals get a lot of medical attention, receiving routine TB tests and physical examinations similar to human medical care. The people who work with the animals are called Laboratory Animal Technicians. They often assist veterinarians, or Lab Animal Technologists, in capturing the animals for physicals and minor surgery. The facilities are usually directed by a veterinarian.

Mannheimer Primatological Foundation is the breeding facility for research primates from which Metrozoo received 0.3 Lar Gibbons on a Breeding Loan. The adult females's estimated date of birth is 1 January, 1970. She was housed with a mature male for the first time on 26 July, 1976, where she stayed for some seven months before becoming pregnant. On 1 October, 1977 she gave birth to her first offspring, a female (Metrozoo ID# 799).

Range of

Hylobates lar



THE BIRTH AND DEVELOPMENT OF A LAR OR WHITE HANDED GIBBON, Continued

The adult female got into a fight with her mate in October 1978. I suspect this was around the time she cycled for breeding. The fight must have been a bad one because the infant had its little finger bitten off, and had to have half of the ring finger amputated. The dam had some lacerations on her hand but not as extensive as her infants. They were both placed in the sickroom for about one week. The dam and her infant were then housed in their old cage from which the male had been removed. The adult female gave birth to her second offspring on 14 June, 1979, the infant was another female (Metrozoo ID# 797). The gestation time confirmed that the fight in October occurred while the dam was in heat. The dam and the newborn were placed in the sickroom for observation for four months, then the three females were housed in their old cage. The female's mate was a dark phase White Handed Gibbon and both of her offspring were dark phase gibbons. After September 1979 there were no more births due to the death of the adult female's mate. In May 1981, the three females were moved to Metrozoo on a breeding loan.

PRE-METROZOO HISTORY OF THE SIRE

The sire (Metrozoo ID# 231) came from an average zoo background. He was purchased from the San Francisco Zoo on 17 April, 1963 and shipped to the Crandon Park Zoo. His approximate date of birth is 1 January, 1953. From researching past records from Crandon Park Zoo, my overall impression was that he did not like people; this coupled with the fact that changes in staff often occurred and no one had an understanding of his actions. The male was often referred to as a vicious animal, and he had grabbed his share of keepers by the hair.

When he was housed with the female there were often fights that resulted in injuries to the female gibbon. There were reports of breeding and two female offspring were born (Metrozoo ID# 232, 234). When he was moved to Metrozoo it was feared that he would not be a good breeder because of his age which was estimated to be 30 years. I was told by one of his former keepers that he never attempted to breed his offspring. The sire is a blond phase lar gibbon. His mate was a dark phase lar gibbon and both of his offspring were blond phase lar gibbons.

INTRODUCTION OF GIBBONS TO PRIMATE ISLAND

Metrozoo's primate islands originally opened in the spring of 1981 with a 1.2 group of Lar Gibbons. The group consisted of the sire (Metrozoo ID# 231) and his two offspring (Metrozoo ID# 233, 232) from a previous mate at the Crandon Park Zoo. For exhibition purposes Metrozoo utilized the 1.2 group until a suitable mate could be found for the male gibbon.

The zoo learned that the Mannheimer Primatological Foundation had an adult female Lar Gibbon and was able to arrange to take her and her two offspring on a breeding loan arrangement. With the new females on their way to the zoo, a suitable facility had to be found for the 0.2 Lar Gibbons exhibited at the Metrozoo. A breeding loan was arranged with the Tampa Busch Gardens Zoo for these two animals.

The 0.3 gibbons from Mannheimer were sent to Metrozoo in May 1981 and the introduction process began. The animals didn't know it, but they were lucky enough to be placed in a zoo so new that it was only open on weekends and holidays. This gave the group a gradual adjustment period to each other without having the stress of dealing with the public seven days a week. It was also beneficial to the research animals in adjusting to a public life.

THE BIRTH AND DEVELOPMENT OF A LAR OR WHITE HANDED GIBBON, Continued

There were few problems with the introduction much to everyone's surprise. Since the animals had plenty of space to get away from one another, I feel this kept fighting from getting out of hand. Also the fact that the three females were more of a family meant they usually stuck together leaving the male at a distance.

THE BREEDING PAIR

The sire (Metrozoo ID# 231) and dam (Metrozoo ID# 798) began showing breeding behavior as early as November 1981. This was at first a surprise since previous behavior between the two adults showed that the dam was dominant. The male was being fed outside of the nighthouse facility because the female and her two offspring were dominating him. We decided that it would be best for the male to eat with his new mate and her offspring and so began feeding the entire group inside the nighthouse facility. At first the male was chased out and threatened by the female and her juvenile daughter. Then in December the adult female cycled and the breeding started again between the two adults. This time the male became more aggressive, overpowering the female, and chasing her out of the nighthouse. One month later the pair were often seen eating together and the female would occasionally groom the male. It was evident that the pair had begun to pair bond. Observations of breeding and breeding behavior were becoming more commonplace.

By April I strongly suspected the dam was pregnant and collected a urine sample for pregnancy testing. The test results were negative, but I still continued to observe the female. In May I observed the previous offspring nursing, this confirmed my suspicions that she was pregnant. She gave birth to a female infant (Metrozoo ID# M00062) on 12 July, 1982.

The sire was observed keeping his distance after the birth took place. The main change in his behavior was that he became more aggressive towards our adult male siamang on the other island. The male gibbon became so distracted with the male siamang that he would not come inside the nighthouse for his food. The siamangs had to be locked up first or the male gibbon would sit where the male siamang could see him and "air bite" in an aggressive display.

Three to four months after the birth, the gibbon pair would be seen sitting together, showing the dam's acceptance of the sire's presence again. As the infant matured the gibbon pair would be seen eating together calmly, but it was more noticeable that the dam's main interest was in caring for her youngster.

DEVELOPMENT OF THE INFANT

Month (1). The infant looks healthy from date of birth and strongly clings to mother. When infant cries, mother cups its head in her hand lifting its mouth to her nipple to nurse. Infant nurses so much that stomach bulges on both sides. First stool is normal and infant is observed urinating. Infant sleeps most of the day and is not very active. Mother lets me see infant closely in nighthouse facility. At the end of first month the infant has two teeth on upper and lower front of mouth erupting.

Month (2). Youngest sibling is near mother most of the time observing the actions of the infant. Oldest sibling tries to groom infant in an effort to distract the mother so she can hold the infant. The mother allows me to touch infant and I can count teeth as they erupt. When

BIRTH AND DEVELOPMENT OF A LAR OR WHITE HANDED GIBBON, *Continued*

touching infant's hand, it is warmer than I expected. The infant is so small that when the mother raises her legs they blanket the infant with her hair, creating an insulating effects, keeping the mother's and infant's body heat in. Infant still sleeps alot but is more aware of moevment.

Month (3). Infant becomes active at various times throughout the day to swing and climb, then tiring it falls asleep. Infant begins to vocalize with a "hoot" more often. The mother appears to tire at times when the infant becomes active and keeps mobile to prevent the infant from moving. The infant becomes frightened when the mother moves. The infant had brown stains on the teeth from the oil secreted from the skin on the mother's chest.

Month (4). First attempts to eat solid food are made (i.e. infant sucks juice from an orange and mouths a piece of lettuce). When I "hoot" to the infant she responds by "hooting" back. Mother and infant spend a lot of time on the ground foraging in the grass. Infant chews, swallows, and taste tests everything her mother eats.

Month (5). Infant now chews soft chow and produce (i.e. banana, apple, and orange). Infant and mother alternate between sitting in shrubs and sitting on the ground. Infant makes first attempt to escape from mother but jumps back in seconds. Infant cries during territorial call in a.m. Both siblings react by embracing the mother and the infant when the infant cries. At the end of 5 months the infant and mother spend more time in the shrubs than on the ground.

Month (6). Infant tries to stand but falls due to lack of muscle coordination. Infant plays most of the day with her siblings, I believe this play acts as exercise to strengthen muscles. When siblings try to kidnap infant, they often pretend to groom the infant, trying to catch the mother off guard. By the end of 6 months, the oldest sibling tries to grab infant and holds infant for a few seconds. When she tries to grab the infant again, the mother takes infant and swings off.

Month (7). Infant named Datu, after a city in the range of the Lar Gibbon. Datu observed "play biting" for the first time with youngest sister. It is clear that the mother allows more interaction between the youngest sibling the the infant.

Month (8). Infant climbs on its own and mother allows it. Mother takes infant in tallest trees on island for climbing lessons. At this point the infant is progressing physically at a rapid pace. Oldest sibling tries to take infant from mother and becomes too aggressive in doing so; mother bites her to warn her away. Infant's time of activity are early morning and late afternoon. Infant now plays with both siblings. Infant is also becoming interested in denser food.

Month (9). Infant now shows ability to brachiate like an adult, although it is not as rapid a movement as with the adults. Mother observed leaving the infant and letting it follow her. She left infant three feet behind and extended her arms still walking backwards--the infant tries to walk to follow her. The infant is showing more motor control in the legs. At the end of month 9 infant stays as far as five feet away from the mother and is brachiating in the lower limbs of the trees. Infant begins to take food from mother's hand rather than fight for it from the pan.

BIRTH AND DEVELOPMENT OF A LAR OR WHITE HANDED GIBBON, Continued

Month (10). Youngest sibling begins to call alone in a.m. when she crescendoes she reaches over and embraces infant. Infant observed drinking water by shoreline with mother sitting three feet away. Infant is now more daring in her brachiating and can walk a few steps at a time without using arms for balance. The mother is becoming less concerned about retrieving infant before moving on.

Month (11). Infant observed sitting on fake trees next to mother during grooming sessions. Mother still leaves infant behind to follow her, but infant now reacts quickly in pursuing its mother. Infant initiates climbing in trees and looks back to see if mother is watching.

Month (12). Infant at 12 months is filled out more and is gaining in muscular development. The infant also vocalizes more with her sisters. The mother often leaves the infant and allows it to climb on its own and play with its sisters.

DIET

A.M. -- 1 orange (squeezed) over 8 oz. Wayne chow No. 8663 (25% protein)
8 oz. Purina chow No. 5038 (15% protein)
1/8 cup raisins

P.M. -- 2 each bananas, apples, oranges, 1 carrot, 1/2 medium yellow squash, 1" slice lettuce, 1/8 cup raisins, 6 oz. Purina chow No. 5038 (15% protein) & 6 oz. Wayne chow No. 8663 (25% protein)

All produce is cut small so that infant gets a chance to consume more volume of the total diet (i.e. infant eats slower than other members and often large pieces of fruit are taken out of its hands before being allowed to eat it.).

LITERATURE CITED

Lekagul, B. and J.A. McNeely. 1977. Mammals of Thailand. Kurusapha Ladprad Press.



Publications Available

Visitor's Guide to the National Wildlife Refuges -published by the Interior Department's U.S. Fish and Wildlife Service. Most of the Nation's 413 National Wildlife Refuges are now depicted on this new handy, pocket-sized map of the U.S. As a convenience to vacationers and day-trippers, these refuges are spotted against an outline of the Interstate Highway System on this colorful and attractive map. On the reverse, a complete run-down of major public use activities on each refuge is provided. Addresses for each refuge are also listed. Single copies available for \$2.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402. (specify stock # 024-010-00529-7).

HISTORICAL CHANGES IN ZOOLOGICAL MANAGEMENT:

How It Affects A New Zoo

By

*Diane Krug, Mammal Keeper
Riverbanks Zoological Park
Columbia, SC*

Man began to study animals while he was still living in caves, and he is likely to go on doing so as long as he walks the earth. Domestication of wild animals began in Paleolithic (Old Stone Age) times with an animal companion, the dog. Since that time, thousands of animals have been brought into captivity for the purpose of entertainment and study.

Zoos have been an attraction for thousands of years. Wealthy men developed cities and indulged their curiosity for the exotics by constructing the first semblances of zoological facilities. The earliest zoo dates back to the Old Kingdom of Egypt from 2900 to 2000 B.C. Thus began the first records of true zoo management. Animals such as Arabian oryx, addax, hyenas and monkeys were brought from far-off places and exhibited for royal entertainment.

Part of the "royal entertainment" unfortunately had no scientific or educational purpose. During Caesar Augustus' reign (43 B.C.-14 A.D.) before the fall of the Roman Empire, venations--animal bloodbaths--were very common. The venatio was an extravaganza during which a variety of exotic animals were killed in the arena fighting each other. Hippos and rhinos were killed along with lions and leopards. Elephants were trained to fight and kill one another. No fewer than 26 separate venations of "African Beasts" were held and from all accounts approximately 3,500 animals were killed in the arena. After the fall of the Roman Empire, zoo collections declined throughout Europe.

Zoological collections began to increase in numbers at the turn of the 15th century as new lands were discovered. Writing and keeping records on animal collections became widespread. Zoological knowledge was being exchanged and handed on by breeders and collectors throughout Europe, Asia, and the Near East.

During the 16th and 17th centuries, several early great zoos were founded. At The Versailles near Paris, Louis XIII, displayed tapirs, toucans, lemurs and other exotics. The Schonbrunn Zoo in Austria was built in 1752 and still survives today. Most of these facilities were still built for the sole purpose of entertaining the aristocracy.

Gradually, interest in zoology developed. It was during the early 18th century that these exotic collections were enriched and enlarged. These zoos exhibited animals mainly to allow people to see strange creatures from far-off countries. They took little account of the animal's comfort. Groups of animals were exhibited in menageries with no regard for natural features.

Throughout the 18th and 19th centuries the great zoos showed a variety of animals in beautiful surroundings, the finest tradition of "human" architecture. They attempted to provide equally for the needs of both the animals and the public. Unfortunately, the most common architectural style of housing was the barred cage. These basic units enabled the visitors to get a close view of the animal. The smaller the enclosure, the less distance the exhibited animals could move from the public.

HISTORICAL CHANGES IN ZOOLOGICAL MANAGEMENT, *Continued*

With this type of unnatural and often times sterile environment, breeding of zoo animals was not common. However, a few species of animals have always bred well in captive environments. Lions have bred with ease for generations since ancient times. Other animal families are difficult or impossible to acclimate at all as breeders.

Attempts at breeding were practiced little or not at all during the early years. Those animals that did breed eventually produced poor offspring due to inbreeding. Animals that did breed created overpopulated exhibits. Lack of breeding during these early years was due to several factors. Besides poor living quarters, lack of attention to diet was another major factor. Food preparation was simple and often quite insufficient to the needs of the animals. Since there was so little knowledge of proper housing and nutrition requirements of exotics, illness and premature death was common. There were no full or part-time veterinarians and the field of exotic animal medicine was unexplored.

Lack of breeding meant having to replace exhibit animals from the wild. Random collecting of species was often the case using the so-called talents of amateur collectors. The normal procedures for obtaining animals was for the collector to announce to the local population that there was a market for particular animals, let them do the hunting, and to ask few questions about how the animals were obtained. Many animals died during shipment due to poor conditions. In the 20th century, shipping animals by sea was still a problem and a perennial source of mortality. With steamships still in their early years, much depended on the circumstances of the voyage. For example, shipping animals from southeast Asia to Europe was difficult because passage was through the Red Sea where humidity was low and temperatures high. Many tropical forest animals, traveling on top of the deck and unprotected, died of exposure.

With only 12% of zoo animals deriving from zoo births, collection by reducing the wild stock was quite common, putting pressure on wild populations.

When wild stock was brought back to zoological parks, it was up to the keepers to clean and maintain these animals. It was not easy to attract people of good general education to take up zoo work on the professional level. Most people with a science background preferred more traditional white-collar jobs. Very few individuals had experience and it was hard for zoos to find people with a feeling of compassion for animals. In the past it was not uncommon for zoo officials to hire prison labor or drunks off the streets to clean cages. How could the zoos of the past be educational tools for the public if its employees hadn't the knowledge themselves? How have zoos of the past changed? To provide recreation and entertainment for the public is still very important. However, education and conservation are quickly becoming the essential purposes of today's zoos.

Most zoo directors are no longer content merely to present healthy animals in clean cages. Nowadays, zoo staff are working to make the surroundings as much like the animal's natural habitat as possible. There is more emphasis on the animal's comfort and less on its availability to the public eye. One significant discovery is that animals breed more readily in natural-looking surroundings, and zoos are being redesigned with this in mind. Many innovations in zoo architecture stem from an increasingly humane approach to the management of captive animals.

Riverbanks Zoo was designed combining many concepts already being used

HISTORICAL CHANGES IN ZOOLOGICAL MANAGEMENT, *Continued*

successfully at other zoos, creating environments that attempt to satisfy both the animals and visitors alike. Most of the zoo's exhibits separate animals from the public not by bars, but by unobtrusive barriers such as moats, tailored to the particular physical capabilities and makeup of each species. These moated exhibits, with psychological barriers, were developed by Carl Hagenbeck for the Hamburg Zoo around 1907. Many great zoos have followed his example for their own exhibit styles. Several of the exhibits at Riverbanks house compatible mixed species.

Just as other zoos have done in the past and are continuing to do in the present, Riverbanks has specialized in species selections. Breeding difficult species has been achieved only in recent years. Many zoos are known for their successful speciality breeding programs such as Brookfield for Okapis, Lincoln Park for Gorillas, and the National Zoo for Red Pandas. Here at Riverbanks Zoo, two of the difficult species which have bred successfully are the Black Howler Monkey and the White-faced Saki Monkey.

Never has there been a more open system of trade and exchange between zoos as there is now, intelligently run using its own journal. Along with all mainstream zoos, Riverbanks uses it to acquire and trade animals.

In breeding management, the present tendency of zoos is to participate in the program ISIS (International Species Inventory System). In utilizing this system, zoos are able to trace individual animals held in zoos around the world. The S.S.P. (Species Survival Plan), a program of AAZPA (American Association of Zoological Parks and Aquariums) was designed as an aid to strengthen and coordinate captive breeding programs of particular species since it is either difficult or impossible to replenish collections from the wild. Species such as the Siberian Tiger have already been coordinated into the plan with which Riverbanks is involved. Cooperation from AAZPA members is essential for successes in the future for such breeding programs.

Also essential to breeding healthy animals is a nutritionally-adequate diet. Riverbanks Zoo spends approximately \$90,000 every year to feed its collection of 600 birds and 160 mammals. A full-time commissary staff of five employees work in kitchen facilities built specifically for preparing animal diets. Our dietary staff has benefited from pioneers such as Ratcliff in Philadelphia who, through trial and error, developed many of the early prepared diets. Today zoos exchange much more information on animal diets than they did in the past.

The modern, well-equipped hospital and quarantine station at Riverbanks is a far cry from the rather grim autopsy laboratory of the 19th century which was the starting point for zoo studies in comparative anatomy. Some zoos have had a long history of concern for the health needs of their animals. However, it hasn't been until the past decade that interest in the clinical medical problems of wild animals has significantly increased.

During the 1960's new zoo hospitals were being opened up about twice as fast as new zoos. Riverbanks Zoo constructed its hospital and quarantine facilities along with exhibit structures during the early 1970's. A veterinarian from an outside private practice was consulted when needed. It didn't take long for zoo officials to realize that the need was indeed great for a full-time veterinarian. In 1978 a veterinarian was hired and a few years later a technician was also hired. Before 1960 veterinarian schools didn't even offer wildlife or exotic medicine courses. Now these schools are beginning to answer the call for increased training in this

area. One such program that Riverbanks offers is the Vet. Student Intern Program. Students work at the zoo for one month during their senior year and gain on-the-job experience working with the zoo's veterinarian. Students in the past have done everything from bottle-feeding a baby Siamang ape to putting a contraceptive implant in a female tiger's neck.

Zoos however, do not only educate future veterinarians, but also future generations of visitors. Today's zoos wish to instruct as well as entertain. Yet ten years ago, how many zoos had the facilities, education departments, to accomplish this task? Relationships between the zoo world and the academic world have been close for over 100 years. Many zoos can take credit for the early beginnings of education programs. For example, the Bronx Zoo had given a course to teachers on how to make the best use of the zoo in school programs for many years.

Riverbanks Zoo hired an Education Curator in 1980. A docent program was established and group tours were conducted. School room lectures were developed using native bird species such as raptors as educational tools. This past September marked the opening of a new educational center at the zoo. This structure, privately funded and costing approximately \$600,000, has a 208-seat auditorium that will be used for films and lectures. There are also two classrooms where weekday and weekend classes will be held and taught by zoo staff and outside educators. Other educational tools at Riverbanks Zoo are the Zoo magazine, Riverbanks, and the graphics distributed throughout the zoo. Until last month, Riverbanks shared the Bronx Zoo magazine, Animal Kingdom, with several other institutions. Several months ago a magazine editor was hired and the month of September marked the first publication of Riverbanks, a publication for Zoo Society members.

Soon new graphics will make their appearance all over the zoo. Graphics, though not utilized by every visitor at the zoo, are valuable sources of information for those who want to learn. Since keepers and other knowledgeable people cannot always be on hand to answer questions, graphics can serve as a permanent source of basic knowledge.

Along with education, there is scarcely a progressive zoo where research is not taking place. It has been the opinion for years that the proper care of animals demands more than a regard for their physical health and comfort. An ability to understand their natural drives, habits, and behavior is also required. Such research was begun approximately two years ago by one of the keepers at the Riverbanks Zoo. Tony Vecchio, who presented his paper on the grooming behavior in a captive troop of hamadryas baboons at last year's conference at Toronto, continues his observational experiments with this particular group of animals. Behavioral research such as this would be impossible without assistance from interested volunteers. At Riverbanks, the staff are very fortunate to have help from several experienced individuals who, after being participants in the docent program, are very knowledgeable about the animals at the zoo. They are the ones who continue to collect observational data vital to research that many zoo people are conducting today. Another form of research has been conducted by the park zoologist since 1975. Alan Shoemaker's literature research has resulted in many published papers on some of the primates exhibited at the zoo.

Who is responsible for the specialized care of these animals used for entertainment, conservation, education and research? Hundreds of individuals who work behind the zoo scene are performing daily duties that are

HISTORICAL CHANGES IN ZOOLOGICAL MANAGEMENT, Continued

essential in preserving a healthy animal collection. Zoo keepers of today have progressed a long way from that individual who, years ago, was quite handy with a water hose. Being an animal keeper requires more than the ability to clean an enclosure and feed its occupants. Today's zoo keeper has the opportunity to learn about an individual animal's habits and behavior and to notice any apparent changes. People who work in this profession are obviously dedicated to their work and are constantly striving to improve on animal care management techniques. Educational requirements vary from zoo to zoo, but most parks prefer at least a high school diploma. Approximately half of the keepers at Riverbanks Zoo either have some college education or previous keeper experience. Since keepers function as educational aides to the public, most are at least general authorities on their animals.

Overnight campouts are a very important part of the educational program at Riverbanks. Approximately 28 campouts are held each year, the first one having been held in the spring of 1980. School groups are brought to the zoo and remain overnight. Several keepers participate by giving the children behind the scenes tours of many animal areas. While the keeper gives a natural history talk on the animals, children are given a chance to see them close up. The children are also taken to other areas of the zoo such as the hospital and commissary. During the commissary talk, the children are given samples of some animal foods such as primate diet and monkey biscuits. Children who attend these campouts always leave the next morning with a very different perspective of the animals than they had when they arrived. The fact that the animals in the collection are wild and not pets is stressed and makes a serious impression on these young people. These outings help children and accompanying adults to realize how important a role the zoo plays in animal conservation.

Keepers at Riverbanks Zoo, like others around the world, are constantly searching for options to enhance the quality of animal life in restricted environments. Whether it be turning a barren gunite exhibit into a naturalistic exhibit with some green vegetation or giving a fish-filled ice block to a bored polar bear, keepers everywhere continue to concern themselves with the welfare of captive animals. A few recent publications such as, Behavioral Enrichment in the Zoo, by Hal Markowitz, focus on techniques for improving captive environments and stimulating behavior in animal collections.

Organizations such as the American Association of Zoo Keepers (AAZK) on a national and local level continue to encourage quality care and instill a professional attitude. Riverbanks has had a local chapter for about two years. Zoo research is promoted by grant money funded through AAZK and allocated to deserving individuals. AAZK symposiums and conferences such as this year's National Conference in Philadelphia and the regional meeting to be held at Riverbanks Zoo on April 19, 20 and 21 of 1984, encourage communication among keepers from other zoos. Zoo keepers come to realize that knowledge is very important to their profession. A zoo could definitely not maintain its valuable collection properly without the individuals who are so devoted to their well-being.

Over a century ago, zoos changed from being luxuries to necessities. They are no longer exclusively for the rich, nor are they solely for entertainment. Zoos now play a vital role in the preservation of many species whose existence is now endangered by the increase in human populations. With the future of many wild populations in jeopardy, what is the future of zoos?

Zoos of the past could have done more than they did to prevent the extinction of species, if only they had realized the dangers in time. It is reasonable to hope that zoos will do everything in their power to increase breeding successes, particularly with rare and endangered species. Specialized breeding programs and the S.S.P. are two methods now being used to aid in the future restoration of zoo species populations. By continuing to keep and breed species in zoos, their survival will always be insured.



HOW I SPENT MY SUMMER VACATION

By
Robert W. Berghaier, Keeper
Philadelphia Zoo, Philadelphia, PA

This summer I took part in an Earthwatch-sponsored expedition to Northern Peru to study the yellow-handed titi monkey. This paper will cover my participation in that endeavor and give a brief explanation of just what Earthwatch is.

Earthwatch was founded in 1971 in response to growing cutbacks in federal funds for research, especially for projects in biology and archaeology--areas which often do not have immediate applied results. Earthwatch works on the following principle: the Earthwatch participants pay to become involved in a project in which they are interested. This monetary input helps to finance the expedition. While on the expedition, the Earthwatch team member takes part in the fieldwork. Often field research involves labor which volunteers can help perform. The research project, through Earthwatch, benefits by both financial and manual assistance.

In 13 years Earthwatch has helped sponsor 450 expeditions in 55 countries and 30 states. Seven-thousand people have volunteered for Earthwatch projects. In 1984, 1600 people will work on 85 projects located around the world. Earthwatch is now the third largest private source of funds in the United States for scholars doing research. A million dollars is raised yearly; a figure that seems small compared to the National Science Foundation budget. However, this amount is roughly half of what National Geographic gives away and two-thirds of what World Wildlife Fund-U.S. awards. These figures do not include the time donated by volunteers.

What does a volunteer gain from his or her participation in an Earthwatch project? The main benefit is hands-on practical experience in a scientific field in which they are interested. It allows the layman to witness science at work while learning in the process. The volunteer should also get a feeling of satisfaction that they are helping a scientific project that furthers man's knowledge of his natural world. Not only do participants get this warm, "smug" self-satisfying feeling, but they can also write off their travel and expedition cost on their federal income taxes. All expenses accrued on an Earthwatch project are tax deductible.

Most volunteers on Earthwatch projects do not bring specialized skills to the expedition. Most provide hard work and enthusiasm. Other participants do provide specific abilities which greatly help on the expedition. Zoo keepers, I feel, fall into the skilled volunteer category. In our jobs,

HOW I SPENT MY SUMMER VACATION, Continued

daily we use our powers of observation and knowledge of animal behavior to perform our duties. This expertise could prove invaluable to a field biology project. Of course, keepers always work hard and enthusiastically, at least some of us do.

Some of the following Earthwatch projects would be of interest to keepers and could utilize the skills keepers possess: humpback whale feeding behavior study which was monitored off Alaska; rhesus monkey group behavior in a free ranging enclosure at the Madison Wisconsin Primate Center; marsupial carnivore study in Tasmania; spotted hyena behavior and ecology in Kenya; a lemur study led by Dr. Allison Jolly in Madagascar; leatherback sea turtles on St. Croix; snow geese population work in Manitoba; monarch butterfly studies at the Mexican wintering grounds; a photographic project in Costa Rican national parks; guanacos in Chile; territorial requirements of birds in Panama.

Projects in 1984 include orangutan studies in Borneo with Birute Galdikas; indris in Madagascar with Dr. Ken Glanders; dolphins off the Florida coast; kangaroos in New South Wales and bird population studies in Senegal. As you can see, Earthwatch can usually match your interest with exotic or close to home locations.

The project I was involved with was Dr. Warren Kinsey's study of the behavior and ecology of the yellow-handed titi monkey (*Callicebus torquatus*). Dr. Kinsey's work started in 1974 with habituation of a titi family group. In succeeding years, Dr. Kinsey, along with student researchers and Earthwatch volunteers conducted in-depth studies on this group. Much of what is known about the yellow-handed titi monkey is due to this project. This wealth of information came to an end in 1981 when it was discovered that the research group's adult female was missing. The group was obviously disturbed and it was impossible to follow the group any longer. Follow-up trips in 1982 showed the group's territory to be abandoned. Dr. Kinsey decided that in 1983 he would open up a new trail system to get access to four other groups and, hopefully, habituate one or more families. Earthwatch volunteer assistance would be needed.

What was the expedition like? Believe me, it was a real jungle out there! The heat and humidity were oppressive. We slept under mosquito netting on wooden platforms. Food was plain--consisting mostly of pasta, canned tuna fish and fruit. We drew our drinking water, washed clothes, dishes and ourselves from the same small stream. The insects were intense. Mosquitoes were present at all hours of the day and night. One afternoon a group of army ants invaded our camp. We turned them back in true "Tarzan-like" style by pouring kerosene in front of them. One night before turning in, the volunteer sleeping next to me found an eight-inch poisonous spider on his pillow. Fer-de-lances were seen on the trails and after I left a bushmaster struck a native worker, fortunately hitting only his boot. I worried more about Isulu ants. These inch and a half creatures had a toxic bite which could make you very ill; several bites could kill you.

Our days started at 4:40 a.m. After breakfast we hit the trails at 5 a.m. The object was to get into position to monitor titi morning calls, thereby recording the position of groups and getting information on territory size. By flashlight we negotiated log bridges, sloshed through mud and dodged spike trees and punji-like stakes resulting from trail cuttings on our way to our manning stations. If titi calls were close we were to attempt to locate the call and follow the titis as long as possible; thus starting the habituation process. These activities usually ended by 8 a.m.

HOW I SPENT MY SUMMER VACATION, Continued

The remainder of the day was usually spent directing teams of native workers opening up trails with machettes or marking the new cut paths. The trails were measured and marked every 30 meters. This marked and mapped trail system allowed accurate data to be kept on titi groups varying patterns and feeding sites. It also made it impossible to get lost while one stayed on the systems path; an important point to remember. To the south, east and west of the trails you could walk in a straight line for five days until you would find other settlements. We usually returned to camp at 5 p.m.

The research area was technically a reserve but it had no patrolling wardens. Most large primates had been hunted out and other large mammals such as tapirs, brocket deer and peccary were rare. Several times we heard shotgun blasts. Dr. Kinsey is trying this year to get the area declared a national reserve and to hire some local people to act as wardens.

In spite of the rainforest and inconvenience and dangers, it was quite a beautiful place. The butterflies and birds were plentiful and colorful. I saw dozens of lizards, toads, poison dart frogs and one vine snake. I also observed tamandua, prehensile-tailed porcupine, agouti, saddleback tamarin and white-faced saki. During the entire two-week stay, I only observed the yellow-handed titi on one occasion for five minutes. Unfortunately, no groups were habituated while I was there.

I found my participation both challenging and educational. The physical work of the project, because of the heat, humidity and long hours, became a matter of mind over body. One gets a great deal of satisfaction by overcoming this adversity. However, I did drop a quick 15 pounds. (Incidentally, Earthwatch projects do not necessarily involve living in such adverse conditions. Dr. Jolly's lemur project was quartered in a hotel which served French gourmet cooking.) I also learned just how much work is involved in field research. It is often tedious, boring work which must be undertaken to make a study accurate. I also found the exchange of information between myself and Dr. Kinsey and his graduate students valuable. We discussed their past field projects and areas in which they had worked. I was suprised that they had as many questions about my zoo experience as I had about their studies.

I feel keeper participation in an Earthwatch project is both a good thing for the keeper and the keeping profession. By volunteering the keeper gains new experiences which can only make him better at his or her profession. The profession benefits by having keepers and researchers meeting and establishing contacts and exchanging ideas. I personally feel that keepers have a lot to offer to field research through insights gained in their work with captive animals. Keeper participation in an Earthwatch project is an excellent way to promote this idea. I urge keepers to seriously consider volunteering on an Earthwatch project. You'll be a better keeper for it.

Those interested should contact Earthwatch, 10 Juniper Road, Box 127, Belmont, MA 02178. Some limited financial assistance may be available.



SO YOU WANT TO BE A STAR

By
B. Wayne Buchanan, Keeper
Woodland Park Zoological Gardens
Seattle, WA

At the 1982 AAZK Conference, the Education Committee of which I am a member, officially came into being. Our initial efforts were to be aimed at basic keeper training. Part of this effort the past year was the making of a training video tape on the subject of zoo keeper safety. The Education Committee hopes to continue this project by involving keepers nationwide in making more zoo keeper training video tapes. There is an excellent array of expertise within the AAZK membership. This is an ideal means of taking advantage of this expertise to aid training of present and future zoo keepers. The pilot tape is now complete. Now, it's your turn!

Having now accrued the experience of one entire training tape, I'd like to take this opportunity to encourage everyone in AAZK to seriously consider participating in this program, and also to offer a few suggestions for would-be producers.

It is imperative that you make every possible effort to achieve the highest quality video production possible. The power of the video camera comes from its ability to hold our attention by appealing primarily to our visual sensory system. The more flaws that appear, even very subtle flaws, the more the viewer's attention will be interrupted, and the less effective the program will be. This is true regardless of the informational content of the program.

The most effective recommendation I can make toward achieving this is to get technical assistance. Good camera work and use of editing equipment and editing theory are not learned in a day or two of experience. Assistance from people with skills in these areas will make a tremendous difference in the quality of the finished product. It is very evident that I had such help in the making of my tape.

Some possible sources of assistance follow.

Perhaps your best possible source of help would be a university, college, or even a high school with a video communication curriculum. Students would likely do your program as a class project so their help should be free. They should also have access to good equipment.

Public access television is an alternate source of help. If you have such a facility in your area they may be able to provide training for yourself, loan of equipment, and possible assistance by trained personnel.

With a little luck one might be able to convince a local television station to donate their time, people, and equipment for your production. This would involve substantial money on their part and would be the least likely of these sources.

Should you be fortunate enough to get trained assistance, they will no doubt want to exercise some creativity. Do not discourage this. Indeed, you might encourage it. First, it will most likely improve your program. Second, such experience is, especially for students, the major benefit they receive for helping you.

SO YOU WANT TO BE A STAR, Continued

However, you are the expert on the subject. You must be sure that their creative efforts enhance the primary emphasis of the program and not dilute it. The instructional value of the program must be maintained.

Plan on spending some time on the project. My project required approximately forty hours of taping and seventy hours of editing to produce an eighteen minute program. This does not include the time spent planning and writing the script. It might have been completed in less time, but this would have been reflected in the quality of the final product.

Limit the number of people involved as much as possible. This will enable the project to run smoothly by streamlining the decision making process. I received good cooperation from the administration and keepers of Woodland Park Zoological Gardens, but only myself and two communications students were directly involved in the production. I had complete control of the content. The students did the taping and editing with my having the final say in these areas also. You can't get much more streamlined than that.

I must add here that the students were very good about offering several options for taping or editing a scene and asking which I preferred. Often, one way seemed as good as another, and I would let them do as they saw best. This gave them some creative freedom. It also gave me a very well done program.

Plan the entire program in detail before you begin actual taping. Write a script. Plan scene by scene what type of shots you want. Plan alternate shots should your first choice prove unfeasible due to weather, uncooperative animals, lighting, or scheduling. Shoot many of the scenes more than once from different angles. You can then choose the best shot, or edit two or more together for a single scene.

Some zoos may have a stock of existing video footage. Though some of such footage may prove useful, it is doubtful one could build an effective program primarily around this source. It is not likely enough of the tapes would be specific enough for your subject.

Lastly, spend some time analytically viewing television news reports and programs. Note especially the editing techniques. One of the most important points to note is how seldom any shot lasts longer than five to seven seconds before there is an edit. Also, most scenes will be formed by editing together several views of the same shot. Evening news reports have good examples of scenes that begin with a reporter speaking to the camera, then cut to shots of the subject being discussed while the reporter's audio continues, and cut back to the reporter still speaking.

Such techniques will help give your program an appearance of professionalism rather than of a home movie. However, it should also be noted that if such editing is poorly done, it could be more harmful than helpful. Your abilities in this area may be limited by the equipment available.

In closing, I would again urge everyone to consider participation in this project. "Dedicated to Professional Animal Care" is the AAZK motto. I can think of no better way of fulfilling this motto than the production of a well-founded, effective, instructional video program.

It may not only enlighten many of today's zoo keepers, but also set standards for future zoo keepers to strive toward for many years. To do this would be no small accomplishment. You have only to meet the challenge.





ANIMALS IN EDUCATION

By
Jennifer Selzer
Supervisor Live Animal Unit
Academy of Natural Sciences
Philadelphia, PA

Founded in 1812, the Academy of Natural Sciences is the oldest natural history institute in continuous existence in the Western Hemisphere.

Its collections include such national treasures as the plant specimens gathered by Merriwether Lewis and William Clark during their historic exploration of the west, the bird specimens Audubon used as models for his historic paintings, and Thomas Jefferson's own fossil collection.

The Academy remains deeply committed to the dual purpose set forth long ago by its founders to promote research and education in the natural sciences. To aid in its educational programs, the education department began three decades ago to use live animals in its museum and classroom presentations. The idea proved to be highly successful and the use of live animals became a hallmark of the Academy's programs.

The Academy is situated in center city Philadelphia, a highly urbanized area. There are no natural areas close enough to be useful as a teaching aid. The education staff has to rely on the students' past experiences (which are often limited), the Academy's dioramas, slides and live animals to teach natural sciences. Of the teaching aids, live animals are the most important. Students soon become restless when made to watch slides for forty-five minutes. Dioramas are nice to look at and are educational, but students often do not realize that mounts were once living animals and they rush on by. When a live animal is used, all eyes become focused on the animal and what is said about it. Urban children have very little understanding of what a wild animal is. They may be able to identify the animal from seeing it on TV, but they will marvel at the way it moves, feels, smells, acts and at seeing the animal in person. A teacher could lecture all period on the differences between Reptiles and Amphibians and still have students leave calling a salamander a lizard. If the animals themselves are used to illustrate the differences, the students will come away retaining more information and a greater respect for the animals.

At the Academy we have three different educational situations in which we use live animals. During the school year, the animals are extensively used in the classes we teach. These are 45 minute lessons on specific topics such as Reptiles and Amphibians, Survival, and Habitats. Here the animals are used to bring across a specific point, and not for show and tell. In the survival lesson we use a rabbit to demonstrate how it survives by using its large ears to pick up the sound of approaching predators; side-placed eyes to see what is approaching; and strong legs for running. For the visiting public, the Academy offers two live animal programs: Eco Shows and Mini Shows. Eco Shows are 30 minute formal slide and live animal programs. The animals here are used in much the same manner as they are in the classes. Mini Shows are informal 15 minute programs given in the halls of the museum. Here the use of live animals is at its finest. During these one-on-one programs, the public is able to use all of their senses to experience the animals and to ask questions. More myths and misconceptions regarding animals are dispelled at these programs than during any of our other programs. It is just as important

ANIMALS IN EDUCATION, *Continued*

to educate the adult visitors as it is the children. Through Mini Shows we are able to educate the entire family. In addition to these in-house programs, live animals are also used in the Academy's out reach programs in which we go directly to the school or organization. The result of this type of animal-student interaction is often greater than when the student visits the Academy. The student is not only experiencing the animal, but the animal is right there in the child's space making the experience more personal.

In teaching natural science, live animals are very important, but is it justified? The Academy's animals are what is known as "hardship cases." They are animals which are unable to survive in the wild. The reasons vary--some are ex-pets which are not native, or, as with the skunks, have had the defenses taken away. Others, such as the hawks and owls, were injured in the wild and are unable to be rehabilitated. For these animals, it is either life in a cage or death. It is difficult to know how the animals feel about the situation or if they do. One way is by health and how old the animal is. A discontented, poorly cared for animal will not live as long as one who is contented and well cared for. The Academy's Live Animal Unit prides itself on the care given to its animals and their longevity. Iris was a North American Porcupine who was found as a baby and hand-raised by the staff of the Live Animal Unit. Until her fifteenth year, Iris was housed in a small dog kennel cage during the week and shared the Unit's exercise room with the Unit's other female porcupine, Punc, on the weekends. During Iris' fifteenth year she and Punc were placed in a large chain link cage which gave them both horizontal and vertical movement. Shortly after the move, breeding behavior was observed between the two porcupines, and the sex of Punc came into question. Iris did conceive but the fetus died, causing an infection to spread through Iris' body. An ovariectomy was performed in an attempt to save the female. Though she came through the surgery, the strain and her age were too great. Iris died at fifteen as one of the oldest North American Porcupines in captivity. Iris is one of many Academy animals which have lived past normal life expectancy.

The Academy is not only careful about the care given to the animals while they are in the quiet confines of the Live Animal Unit, but also that given them during programs, classes and while in transit. The arriving cases used to transport the animals are carefully picked to insure the animals' safety. Birds are packed in solid, top-loading cases with ventilation holes on the ends. This type of case keeps the birds in the dark, which tends to keep them calm. Mammals are packed in front-loading, plastic cages. They provide the greater ventilation needed by the mammals as well as being easily disinfected. During presentations, the animals are treated with respect and as wild animals, that is to say, not treated as pets. One of the dangers in using live animals as a teaching aid is that the public tends to see the animals as pets. Therefore it is extremely important that the animal is not presented as such. Anyone who works with the Academy's animals must go through extensive training to learn how the animals are handled. This insures that the animals are handled the same by everyone.

Many of you may be thinking about starting an education program using live animals as teaching aids. If so, I would like you to think about why you are doing it. Is there a need for this type of educational program in your community or do you just want to keep up with other zoos and museums in your area? If you do go with the program remember to check permits. Some areas require special permits for this type of program. Also try not to have your animals do double duty. Being in programs is stressful, so don't add to it by also having the animal on exhibit.



Coendou prehensilis: A Comparison To
Other New and Old World Porcupines

By
Suzanne Brand & Angela Keppel
Dept. of Zoological Research
National Zoological Park, Washington, D.C.

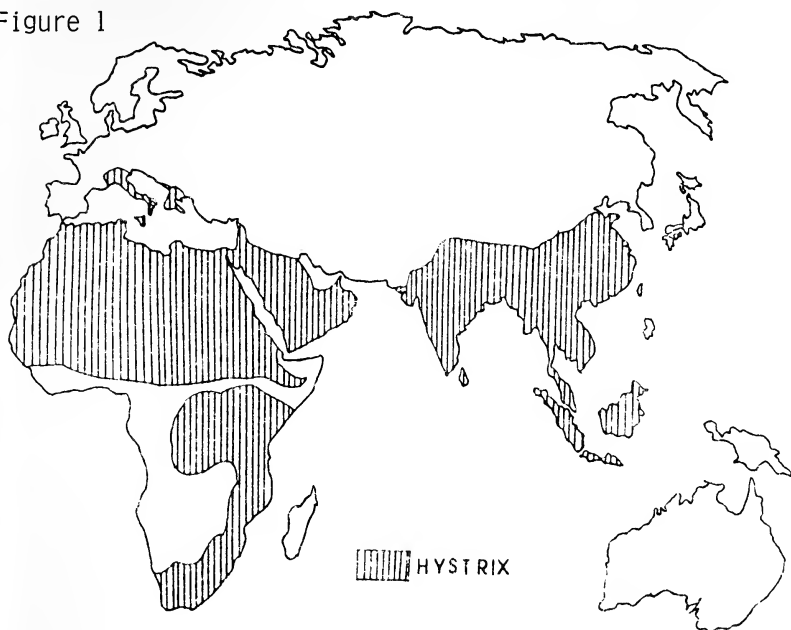
Porcupines exist in both the New and Old Worlds. These rodents are taxonomically divided into two families--the family Hystricidae in the Old World and Erethizontidae in the New World (Walker, 1975). There are four genera found in Africa, Asia and Europe. These are Hystrix, Atherurus, Thecurus, and Trichys. In the New World of North and South America, there are also four genera: Coendou, Erethizon, Chaetomys, and Echinoprocta. This paper will deal most extensively with Coendou and Erethizon.

Because both families are Hystricomorphs, there is some sort of relationship between them. Stuart Landry (1957) believes this relationship is due to a common origin, but that similarities between the two are due to parallelism as the families evolved in similar directions after a discontinuity took place. Landry has a very strong argument in support of the use of parallelism to determine phylogenic relationships among the Hystricomorphs. Parallelism could possibly explain two similarities found in both Hystricidae and Erethizontidae. First of all, the presence of quills is a good example of possible parallelism. Aside from being Hystricomorphs, there is no special relationship between New and Old World porcupines, "so that the possibility that spininess could have been inherited from a common ancestor is slight (Landry, 1957)." Secondly, the inflation of the frontal sinus and nasal cavity has been well documented in Hystricidae. Similarly, this has taken place in some species of Coendou in the New World (Landry, 1957). This phenomenon, to the extent visible, is not known in any other rodents and could well be parallelism.

The family characteristics of the Old World porcupines set them apart from the New World porcupines, particularly in the fact that Hystricidae are terrestrial animals while Erethizontidae have been modified for an aboreal lifestyle. Depending on the genera, Hystricidae are usually known as either Crested porcupines or Brush-tailed porcupines. The genus Hystrix is usually taken as the type of species. This African crested porcupine weighs between 17-30 kg and is up to 950 mm long (Walker, 1975). It is the largest of the African rodents, having a body covered in long dark brown or black and white spines banded with white or yellow. A set of very long black quills along the back give the appearance of a crest when erected (Roberts, 1951, Haagner, 1920, Walker, 1975). Atherurus is slightly smaller with lighter coloring. Most importantly, its tail ends in a thick tuft of bristles that rattle when shaken (Walker, 1975). Hystricidae are nocturnal animals with very limited climbing ability (Walker, 1975, Haagner, 1920, Lydekker, 1894-95). Their habitat is varied, comprised of desert, savannah, forests, and rock areas. Hystricidae feed on vegetation consisting of bulbs, roots, tubers, fruits, and even cultivated crops (Haagner, 1920, Lydekker, 1894-94, Prater, 1965). They usually are solitary, but can frequently be found in groups of one to eight individuals in a burrow (Ahmad, 1977).

Figure 1 shows the extensive distribution of Hystrix. In addition, Atherurus' range tends to overlap with Hystrix. They are found in central Africa from Kenya to Sierra Leone and also India, China, Malaysia, and nearby islands. Thecurus is limited to Indonesia, while Trichys lives in Borneo, Sumatra, and Malaya (Honacki, 1982).

Figure 1



As one might expect, New World porcupines have some very different characteristics from Old World porcupines. The North and South American porcupines have comparable habits. Very little is known about the life structure of Chaetomya and Echinoprota, so much of this discussion will be limited to Erethizon and Coendou. Both genera are nocturnal animals that feed during the night. Erethizon does most of its feeding in trees, aided by arboreal modifications on its feet. In addition to modified feet, Coendou possess a prehensile tail which is used while climbing about and even as a prop while at rest.

Erethizon dorsatum, the only remaining species of Erethizon, is usually about 3.5-7 kg and anywhere from 800-1200 mm in length (Walker, 1975). Its upper parts are completely covered with long, thick, sharp barbed quills interspersed with long, stiff guard hairs. The pelage ranges in color from dark brown to blackish with individual quills having yellowish-white bases (Wood, 1973).

Within their natural habitats of pine and fir forested areas with low-lying growth, they feed mainly on tree parts such as bark, leaves, needles, and buds (Walker, 1975, Shadle, 1950, Taylor, 1935, Speer, 1978). Although their winter diet is sometimes as much as 91% conifer (Speer, 1978), they also feed on herbaceous ground vegetation and fruits during the other times (Taylor, 1935). Although they can be found in groups in the wild, possibly around salt or a clumped food source, they are usually solitary (Gillespie, 1978).

Coendou, known by its long prehensile tail, is smaller than its northerly neighbor, weighing from 0.9-4.3 kg and 600-1000 mm in length (Walker, 1975). These expert climbers are covered on the dorsal surface from the base of the nose to the middle of the tail with strong spines of varying lengths and thicknesses. They are shortest (40 mm) on the head and longest on

Coendou prehensilis: A COMPARISON TO OTHER NEW AND OLD WORLD PORCUPINES,
(Continued)

the rump (100 mm). Their overall appearance is dark brown speckled with white because of the banded quills (Husson, 1978). In one species, Coendou mexicanum, a dark fur conceals the spines (Goldman, 1920). They have a very distinct snout that is swollen, giving it a pig-like appearance.

In South America, Coendou can be found in evergreen rainforest, Cerradao, and savannas with tall trees (Alho, 1982). Their natural diet consists of leaves, shoots, roots, stems, blossoms, cambium, and even corn and manioc (Rohl, 1942, Walker, 1975, Lydekker, 1894-95). Usually solitary in nature, they have been seen for short periods in pairs on the ground.

In contrast to Erethizon and Coendou, very little is known about the other genera, Echinoprocta and Chaetomys. The single species of Echinoprocta, E. refescens, is arboreal, but not as much as Coendou (Lydekker, 1894-95, Walker, 1975). Its coloration is pale brown to black on the sides of the chin, throat, and underside paler. The head is speckled with whites, with a short white streak in the center of the nose. There is a crest of white spines on the nape, the other spines get shorter as they reach the rump. The tail is short, hairy, and not prehensile (Walker, 1975).

Chaetomys subspinosus, the thin-spined porcupine is dull brown or greyish-white with its back covered by hairs that resemble bristles more than spines. The head, neck, and forelimbs are covered with thin spines. The tail is naked and scaly, but most believe it is not prehensile (Walker, 1975). Chaetomys are diurnal, living in wooded areas with bushes or in tangled vegetation around savannas (Walker, 1975).

Erethizontidae are distributed according to the map on Figure 2. Echinoprocta is found in the higher elevations (8,000-12,000 ft.) of Columbia. Chaetomys lives in northcentral and northeastern Brazil. It has been given endangered status by the United States (Honacki, 1982).

Reproductive aspects of Erethizontidae have been extremely well documented for the genus Erethizon, but very little data is known about South American species. Albert Shadle (1946a, b, 1951, 1954) did quite a bit of laboratory studies of North American porcupines. Their reproductive habits are very clear. The information available included not only extensive data on parameters like gestation period, breeding seasons, litter size, but also narrative descriptions of courtship, copulation, and birth.

There is agreement among most sources on the parameters already mentioned. Table 1 shows a more complete picture.

Table 1

Gestation period:	205-217 days (mean = 210 days)
Breeding time:	Autumn through early winter Heat lasting 8-12 hours
Season of birth:	Spring (late March through June) Later in summer in northerly areas
Litters per year:	One
Young per litter:	One, rarely, two
(Woods, 1972, Walker, 1975, Shadle 1951, Shadle, Smelzer, Metz, 1946)	



Figure 2

The species of *Coendou* have not shared the same light as *Erethizon*. Very little is known about their life history, especially in the wild. Therefore, data collected from animals in captivity is very valuable. At NZP, records have been kept on a number of births since the mid-1970's. The gestation period has not been pinpointed as yet, but there appears to be a rather consistent birth space interval, as shown in Figure 3. This could indicate that copulation occurs soon after parturition. Like their North American relatives, *Coendou* breed once a year. Figure 4 displays the monthly distribution of births at NZP.

As evident by the scarcity of information available, more research is needed to get a better understanding of reproduction in South American porcupines.

The newborn *Coendou* is very large, one fourth the size of his mother. The baby gains weight rapidly (see Figure 5) and is able to eat solid food as soon as he develops enough dexterity to grasp a piece of food. In captive *Coendou* at NZP, babies only nurse a few times daily for a few minutes at a time. The mother stands on her hind legs with her forelegs raised to give the baby access to her nipples. The newborn baby stays in one spot in the cage all day. The male *Coendou* may sniff the baby, but otherwise does not participate in raising his offspring. The female does not make a nest of any sort and does not sleep with her young.

Figure 3

Birth Intervals

Source: NZP Records

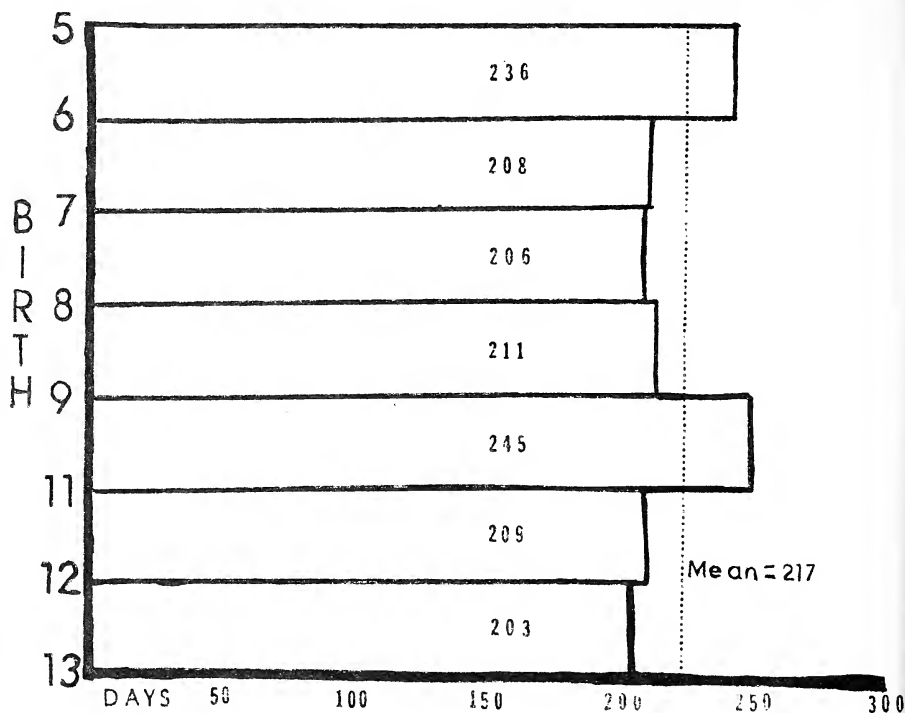
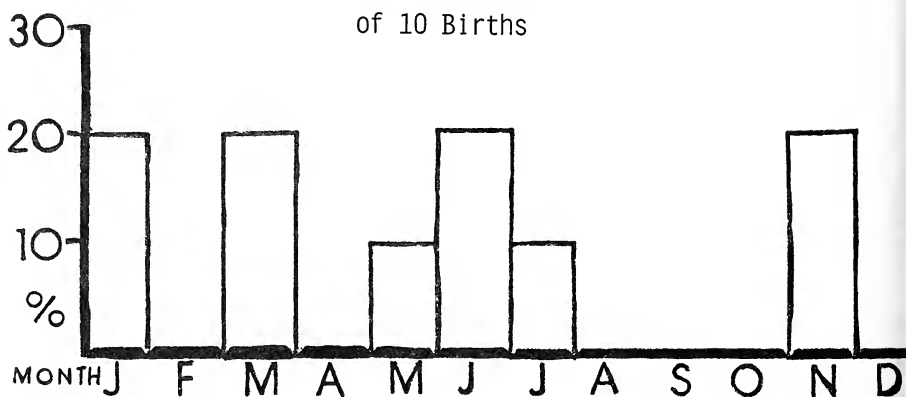


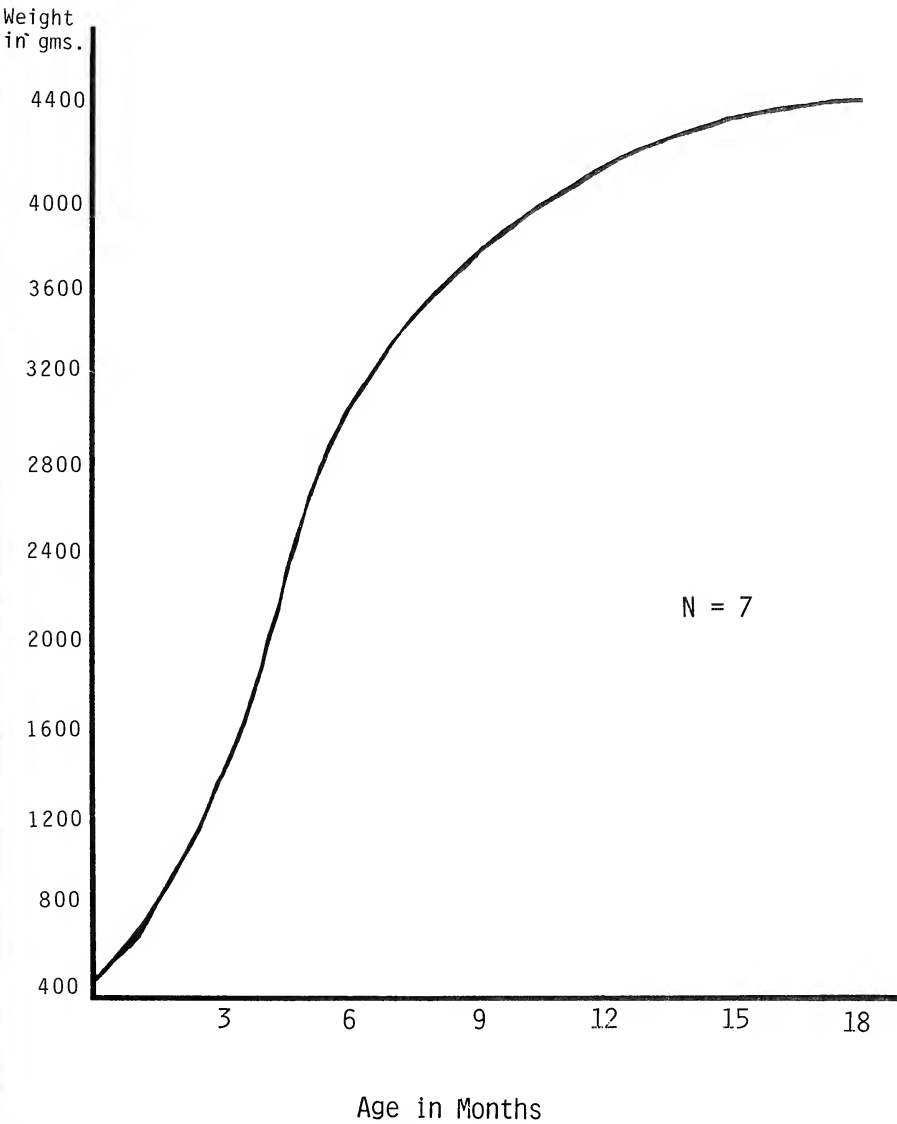
Figure 4

Monthly Distribution
of 10 Births



Source: NZP Records

Figure 5 Estimated Growth Curve
Source: NZP Records



Coendou prehensilis: A COMPARISON TO OTHER NEW AND OLD WORLD PORCUPINES,
(Continued)

Coendou's start life with long red guard hairs covering their body concealing the soft, flat, short spines which harden after birth. They vocalize with a loud fussing whine when handled. The pungent Coendou smell is not present in the newborn, but develops and is noticeable about a month after birth. The quills grow very rapidly, and the three-week-old Coendou has white quills on his head, but the rest of his body still looks red. At five weeks of age, the quills on the baby's back are now longer than the red guard hairs giving him the black and white color. At ten weeks our baby Coendou was seen nursing, but the mother was chattering her teeth in irritation. The baby's teeth at this stage are beginning to change from white to having an orange tinge. The adult Coendou has orange front teeth.

At NZP we have ten Coendou and they are nocturnal, but begin to become active around 2:00 p.m. when the food cart enters the room. Individual animals whine in anticipation when they are hungry, triggered by the sound of food preparations. We feed them carrots, sweet potato, corn, apple, kale, orange, monkey chow biscuits, and grain. At 3:00 p.m. the lights go out in the room where they are kept and it's nighttime.

What does it mean when we see porcupines racing around their cages, shaking their quills and stamping? Are these aggressive actions or are they playing? According to Albert Shadle, there are two types of play in which Erethizon engage: solitary and collective. Solitary play is where an animal may defend itself from an imaginary enemy. A porcupine may walk, run, climb, gnaw, or do the exercise dance which is where they rock back and forth on their back feet stamping in rhythm. Collective play is where two or more animals play together, attacking, seizing, holding, biting, and wrestling with each other.

In our Coendou, we have seen examples of both solitary and collective play. Individual animals, like our adult male, "Spike", frequently engage in solitary play by running around in circles sometimes switching directions. Young Coendou often hang upside down from a branch by their tails and swing back and forth shaking their quills. This activity can be continued for several minutes. A pair of Coendou may be seen chasing each other in a tag-like game. Sometimes they stop to bite and grab at each other's feet.

In conclusion, we have found that Coendou and Erethizon are similar in several ways. They are both nocturnal, they usually have only one young, their gestation period is approximately 210 days, and they engage in play. They also have modified feet for an arboreal lifestyle.

REFERENCES

- Ahmad, A. and Chaudhry, M. 1977. "Studies on Habits, Habitat and Damage of Porcupines, Hystrix indica, Rodentia, Mammalia." The Pakistan Journal of Forestry. 27(3): 147-150.
- Gillespie, M. 1978. "Porcupines". Conservation (NY). 33(3): 35-37.
- Goldman, Edward. 1920, "Mammals of Panama". Smithsonian Miscellaneous Collections. 69(5): 309.
- Haagner, Alvin. 1920. South African Mammals. H.F. & G. Witherby, London.
- Honacki, James, Kinman, K. and Koeppl, J., eds. 1982. Mammals Species of the World. Allen Press and Association of Systematics Collections, Lawrence, Kansas.

Coendou prehensilis: A COMPARISON TO OTHER NEW AND OLD WORLD PORCUPINES,
(Continued)

REFERENCES (continued)

- Husson, A.M. 1978. The Mammals of Surinam. E.J. Brill, Leiden
- Landry, Stuart O. 1957. "The Interrelationships of the New and Old World Hystricomorph Rodents." University of California. Publications in Zoology. 56(1): 1-118.
- Lydekker, Richard. 1894-95. The Royal Natural History. Frederick Warne and Co., London.
- Prater, S.H. 1965. The Book of Indian Animals. Bombay Natural History Society.
- Roberts, Austin. 1951. The Mammals of South Africa. Bookfund, South Africa.
- Rohl, Eduardo. 1942. Fauna Descriptiva de Venezuela. Tipografia Americana, Caracas.
- Shadle, Albert. 1944. "The Play of American Porcupines (Erethizon dorsatum and E. epixanthum)". Journal of Comparative Psychology. 37: 145-150.
- 1946a. "Copulation in the Porcupine". Journal of Wildlife Management. 10(2): 159-162.
- 1951. Laboratory. "Copulations and Gestations of the Porcupine (Erethizon d. dorsatum)". Journal of Mammology. 32: 219-221.
-1954. "Natural Parturition of a Porcupine and First Reactions of the Porcupette". The Ohio Journal of Science. 54(1): 42-44.
- Shadle, A., Smelzer, M. and Metz, M., 1946b. "The Sex Reactions of Porcupines (Erethizon d. dorsatum) Before and After Copulation". Journal of Mammology. 27(2): 116-121.
- Speer, R.J. and Dilworth, T.G. 1978. "Porcupine Winter Foods and Utilization in Central New Brunswick". Canadian Field Naturalist. 92(3): 271-274.
- Taylor, Walter P. 1935. "Ecology and Life History of the Porcupine (Erethizon epixanthum) as Related to the Forests of Arizona and the Southwestern U.S.". University of Arizona Bulletin. 6(5): 177pp.
- Walker, Ernest. 1975. Mammals of the World, Vol. II. Johns Hopkins University Press, Baltimore.





ARTIFICIAL INCUBATION OF BIRD EGGS

By
Ken Reininger, Bird Keeper
Burnet Park Zoo, Syracuse, NY

Any discussion of the methods and techniques involved in artificially incubating bird eggs assumes that you have some fertile eggs to incubate, and functional incubators to put them in. Therefore, I will begin this discussion by pointing out that preparation for a breeding season should begin months before the actual egg laying will occur. Planning this far in advance will help to insure that you have birds with solid pair bonds, on appropriate breeding diets, and in suitable enclosures, and that this will promote nesting and fertile egg production. It sounds basic, but this type of preparation is often not done, and is often the root cause of lack of breeding success. Don't expect to get viable eggs if you introduce new mates shortly before the expected breeding season, or if you make a diet change at the last minute, or if you move birds to a new enclosure just prior to the breeding season. It just won't happen! As for the equipment - incubators - this is true also. I feel the time to check machines and do repairs and maintenance is at the end of the last incubation season. This is the time to analyze the incubators for mechanical difficulties and shortcomings, and the time to order new parts and supplies. In this way you can have them in perfect working order in plenty of time for the next season's eggs.

THE MACHINES

There are many makes and models of egg incubators, coming in various sizes and shapes, and having quite a range in price. The thing to remember when buying an incubator is to get one which fits your needs. It does not have to be the biggest and fanciest model available for you to have success with it. What it does have to be is durable, reliable, and well designed.

All incubators fall into two of four general categories. They are either forced-air or still-air incubators, and are either self-turning or non-turning incubators. Forced-air incubators are those which have a circulation fan in them, which allows them to keep a more or less uniform temperature throughout the egg holding cabinet. The still-air incubators have no such fan, and in the larger still-air models, this can mean that the temperature will vary in the cabinet. This is something you want to avoid. It is desirable to be reasonably sure that the temperature you read on the cabinet thermometer is the temperature in every corner of the egg cabinet and thus the same for every egg. If the temperature in the back of the machine is a degree or two different than what the thermometer is reading, this is going to cause you and the eggs problems. Therefore, except for still-air machines with very small cabinets, such as the Marsh Rollex incubator, I do not recommend still-air models.

As for self-turning models vs. non-turning models, this is more a matter of convenience. The self-turning machines will rotate the eggs in them automatically, usually through a 90° arc, up to once a hour, 24 hours a day. This saves the keeper the chore of performing this task by hand, and also reduced the number of times the machine is opened and the eggs

ARTIFICIAL INCUBATION OF BIRD EGGS, Continued

are handled. Both of these actions offer the potential for contamination. Also, although there is still some debate on the subject, I believe that the more often the eggs are turned, the higher the hatch rate for the eggs. An automatic turner can turn the eggs 24 times a day. For these reasons I feel that self-turning models of incubators are desirable, but they are not essential to successful incubation. The following are some of the major companies which manufacture incubators. I would suggest that you contact these companies for brochures before you buy equipment.

Humidaire Incubator Company, 217 W. Wayne St., New Madison, OH 45346

Brower Incubator Company, Quincy, IL 62306

Leahy Manufacturing Company, Higginsville, MO

March Manufacturing, Inc., Garden Grove, CA 92643

MACHINE PARTS

To be successful at artificial incubation, I believe you have to get to know your machines and how they work. This is important because certain machine parts need to be replaced at the start of each incubating season, others need to be replaced monthly while the machine is in operation, and still others need to be replaced as they become old and lose their accuracy. Only someone who is aware of these things and is around daily to monitor the incubators will know when and how to change these parts. Also, machines break down--and believe me, they break down at the worst possible times. You will save eggs if you do regular maintenance and minor repairs yourself. Depending on someone else to handle these situations can end up in disaster for the eggs. So with this in mind, I will mention here the major parts to an incubator and their regular maintenance.

We have already mentioned that the more desirable machines will have a small air circulation fan and a mechanism to rotate the eggs automatically. This rotor will also have a timer which sets off the rotating motor. Keep the fan motor and the turning motor clean, dry and well-oiled or greased. This will head off most problems with these parts. The timing device should also be kept clean and dry. Each machine also has to have a heat element to heat up the egg cabinet. The most efficient and easily regulated heat elements are electric. Some electric elements are made of heavy metal bars and are pretty indestructable, but others are heat coils of thin wire--like in older toasters--and these heaters can break easily if fooled with. So in cleaning or working in these type machines be careful not to damage these parts.

The heat elements are turned on and off by a thermostat and a microswitch. The thermostat is a round metal disc about 3" in diameter, and the microswitch is a small, dark cube with a thin metal tongue on it. The thermostat must be replaced at the beginning of each incubation season, and maybe a second time during the season if the machines are used heavily. These discs wear out and lose their accuracy, and can cause the machine to run at the wrong temperature. The microswitches last longer, but they too wear out and should be monitored when they get older just to be safe. The way these machines are designed is that the heater is always on in them until the thermostat and the switch turns it off. Therefore, if either of these parts malfunctions, the heater doesn't shut off and

ARTIFICIAL INCUBATION OF BIRD EGGS, *Continued*

the machine quickly overheats cooking the eggs. If the thermostat or switch is working erratically, the machine can cook your eggs without you even knowing it.

Also in each machine is a pan or set of pans which are the water reservoirs for the incubator. The amount of water added to these pans each day, and the opening and closing of the air vents in the machine, is how you control the relative humidity in them. The water reservoirs are usually right next to or on top of the heat element. The air vents are holes in the walls of the cabinet with little sliding doors over them. Each machine will have its own personality as far as maintaining a level of relative humidity in it. You will have to play with the amounts of water in the tray or trays, and combinations of opened and closed vents to get the desired setting. Some machines will just seem to run at a low level of humidity, and others at a high level. Try to use them for these natural levels and you will find it easier to get them adjusted. The water pans should be thoroughly disinfected at least 2 or 3 times a week while in operation. These warm pans of water are potential bacteria factories, and bacteria kill developing eggs. Also, distilled water should be used to fill the water reservoirs if at all possible.

The last major parts of the incubator are the thermometer, hygrometer, hygrometer wick, and hygrometer water reservoir. The thermometer measures simply air temperature in the cabinet, and should be checked and recalibrated if necessary every year to insure accurate readings. You are going to be adjusting your cabinet temperature to within $\frac{1}{2}$ of a degree Fahrenheit so the accuracy of the thermometer is essential. The hygrometer is a thermometer with a wick pulled over its bulb. The other end of this wick is immersed in the hygrometer's water reservoir. The hygrometer gives you a "wet bulb" reading from which you can calculate the relative humidity in the machine. The wet bulb reading is not the same as the relative humidity and should not be mistaken for it. The relative humidity is calculated by finding the difference between the wet bulb and the dry bulb reading, and looking up in a chart under the column which is closest to your dry bulb reading the computed relative humidity. For simplicity's sake, most people simply refer to the wet bulb reading which they will set their incubator at. This is fine as long as you recognize the difference between the two things. Hygrometers should be checked at the beginning of the incubation season also, and throughout the season too if possible. The easiest way to do this for the hygrometer as well as the thermometers is to put all the ones you have in the same incubator at the same time to see if they all read the same. It would also help to have a recently certified accurate thermometer and hygrometer in there with them. Do not assume that just because it is new that a thermometer or hygrometer is accurate, unless it is certified. You may find out the hard way that it isn't. Wicks for the hygrometers should be changed at the beginning of the season and every four weeks while the machines are in operation. Minerals from the water in the hygrometer reservoir will accumulate in the wick making it hard and crusty, and affecting the accuracy of the wet bulb reading. This will happen even more quickly if you do not use distilled water in the hygrometer reservoir.

The last point I would like to make about the incubators is that if possible, they should be operated in a small room which is itself temperature and humidity controlled. This will help tremendously in getting the incubators adjusted to their own temperature and humidity levels. Fluctuations in the ambient room conditions will cause you to constantly readjust your machines while they have eggs in them, to counter what is going on around them. This is something you don't want to get into.

ARTIFICIAL INCUBATION OF BIRD EGGS, Continued

PREPARING THE INCUBATORS FOR EGGS

As mentioned before, preparations should begin well before eggs are expected. All thermostat discs should be changed, thermometers and hygrometers calibrated, hygrometer wicks replaced, and so on. The inside of the egg cabinet will now need to be thoroughly disinfected. To do this I recommend using a gas which can be made by mixing potassium permanganate crystals with formaldehyde. This should be done using the formula 35 grams KMnO_4 to 30 ml formaldehyde per cubic meter of cabinet space. This gas is very effective, but also quite noxious and should therefore be done in a well ventilated area. Allow the machine to run for an hour or so with the gas in it. Then let air out and wash the inside of the cabinet with a disinfectant in warm water. You are then ready to adjust the temperature and relative humidity for the machine. I recommend getting the incubator set where you want it to run and then running it 2 to 3 weeks before putting eggs in it. Record the wet and dry bulb readings several times a day during this period and throughout the incubation season to insure that the machine is keeping a constant environment. This is the only way that irregularities will be noticed. I would even recommend a "dry run" of the machine using chicken or quail eggs before trusting it with more valuable eggs. Incubators should be disinfected according to the above procedures in between all hatches to reduce the threat of contamination.

Each species of bird eggs will need to be incubated at a particular temperature and at a particular level of relative humidity. These will vary from species to species. Norms have now been established for many species and these should be researched in the literature before attempting incubation of a species. For the most part you will find that the dry bulb temperature for most eggs is between 99.25° and 99.75°F . There are exceptions to this, most notably the ratite species and many of the ground nesting upland galliformes. Just as important but much more variable is the relative humidity specific egg species require for incubation. A general rule for the right humidity can be estimated by considering the conditions in the natural nest site for the species. However, a specific humidity should be determined either through a search of the literature or by contacting someone with experience in hatching the species before you try to do it. And, to repeat once more, the temperature and humidity must stay very constant throughout the incubation period if you have any reasonable hope for successful hatching.

EGG STORAGE

Eggs can be collected and stored for up to 7 days or so and still be incubated successfully. Each fertile egg has a germ or zygote which can last this long if kept in proper conditions. The longer it is held however, the less the chance that the germ will be alive when incubated. To store eggs keep them in a cool, dry place. I would suggest storing them at about 50°F . While in storage, turn the eggs 3 or 4 times a day. Do this by rolling them a quarter of the way around at each turning. If the eggs have excessive dirt or feces on them when collected, try to rub this off gently with a dry, soft cloth. Don't rub too hard for fear of rubbing off the cuticle of the shell. Storage of the eggs in this manner allows you to start a whole group of eggs at the same time in the incubator. This saves time and is better for brooding purposes as well.

ARTIFICIAL INCUBATION OF BIRD EGGS, Continued

PREPARING THE EGGS FOR THE INCUBATOR

When ready to incubate the eggs, several things must be done to prepare the eggs. All eggs are given an identification number. This is usually done while collecting the eggs and is given to keep track of blood lines, and so the progress of the egg's development itself may be monitored. This number is written on the shell carefully in pencil. At this point, a record card is started for the egg. Information such as parentage, date laid, date incubated, egg weight, incubator number, temperature and humidity in the incubator, etc. is recorded. The egg is weighed. Each egg is candled so that its air cell border may be penciled in on the shell. This and the egg weight will later be used to keep track of the development of the embryo. Lastly, each egg is washed in a disinfectant solution. I recommend dipping eggs in a 10% Betadine solution for 15 seconds to disinfect them. The solution should be made of luke warm water to avoid shock to the egg. When removed from the wash, the eggs should be gently patted dry with a soft cloth. Again, take care not to rub away the cuticle.

If you encounter eggs with small cracks in them, these can sometimes be saved. Locate the crack using an egg candler and mark the entire cracked area. Then take some pure bees wax or parafin and gently rub it over the cracked area, covering it with a thin coat of wax. You won't be too successful with large cracks in the shell, but I have had eggs with cracks of a inch or a little larger go full term and hatch like this.

MONITORING DEVELOPMENT

I have used two methods of monitoring the embryo during its development. The first method involves frequent checking of the egg's air cell. As the air cell increases in size with development of the embryo, it is penciled in on the egg shell. By the end of the incubation period, this air cell should take up roughly one third of the egg volume. The increase in the size of this air cell should be a slow and steady one from beginning to end. By estimating where the air cell should be at any point in development, and by knowing where it is by candling the egg, you can determine if the development is going normally. If the air cell is not showing a gradual, steady increase in size toward that one third egg volume mark, things are probably not going well.

Another method of checking development, especially with eggs whose shells are too thick to allow accurate candling, is to monitor the weight loss of the egg. This should exhibit a steady decline over the course of the incubation at the rate of about 15% of the original egg weight. This 15% can be + or - 3% depending on the particular species of bird. But this at least gives you a range for normal weight loss, i.e. development, and a chance to do something about it before it's too late. If the air cell is enlarging too quickly, or the egg losing weight too rapidly, you can try to reverse this trend by moving the egg to an incubator of higher humidity until it resumes a more normal pattern. On the other hand, if the air cell is not dropping fast enough, or the egg not losing weight fast enough, try putting it in an incubator of lower humidity until it resumes its normal pattern. You may be able to save eggs by monitoring them in such a way, or at the very least, notice errors in your calculated humidity level for incubating a certain species (or a machine malfunction). One confusing point though--infertile eggs will lose weight at the same 15% rate if kept in the incubator full term. Thus weight loss is not an accurate indicator of fertility. Air cell development and egg candling

ARTIFICIAL INCUBATION OF BIRD EGGS, Continued

are however very reliable methods for determining infertile eggs or embryos which have died. Where this method can be used, it should be used to identify bad eggs for immediate removal from the incubator.

While being incubated, eggs should be turned or rotated a minimum of 6 to 8 times per day. This is done to prevent the egg shell membrane and the embryo from sticking to the shell. With automatic turners this can go on 24 times a day, and this is great. If you don't have these kinds of machines, make sure you do it by hand every hour or so throughout the day. Roll them about $\frac{1}{2}$ of the way around at each turn. Always turn them in the same direction so that it is done evenly on all sides of the egg. Even with automatic turning incubators this should be done at least twice a day to avoid the eggs being rotated always through the same 90° arc. When hand turning it helps to set out little reminder cards with times on them to help you remember when the last turning occurred.

It is also advisable to cool the eggs down once a day. This can be done by turning the machine off for a half hour or so each day, or by taking the eggs out of the incubator for 15 minutes or so once per day. This recreates a natural cooling which would usually occur as the parents would leave the nest to feed daily.

HATCHING

About four days prior to the estimated hatch date, stop turning the eggs entirely. At this time also place them in an incubator with a wet bulb reading of about 90°F. Also begin to candle the eggs frequently if possible for signs of the chick pipping into the air cell. If candling is not possible, listen to the egg, preferably with a stethoscope for vocalizations. Once in the air cell, the chick has between 6 to 12 hours to pip through the egg shell. If it is not showing much progress after 24 hours from when it pipped the shell, and if it is a valuable species, you may wish to help it out of its shell. This can be done, but can be very tricky.

The shell and outer membrane must be peeled back slowly and carefully. Avoid at all costs touching or tearing the inner membrane, which still has live blood vessels in it. You may peel back to the edge of what was the air cell, but no further. Then put the egg back in the incubator for awhile. When a section of the inner membrane looks dried and hard, you may begin to peel it back. Stop as you get near any part of this membrane which is not dried and hard. If at any point you cause bleeding, you must stop and wait, putting the egg back in the incubator until more can be done. When you have been able to peel the shell and both membranes back to the border of the air cell, grab the bird's beak and gently untwist and unwrap its head from under the wing covering it. At this point, kept moist and warm in the incubator, it should be able to do the rest itself.

After hatching, the chick should be kept in the incubator at 99°F. for 24 hours or so. Still absorbing the egg yolk, they will not need to eat for this period of time. I recommend cleaning the umbilical with a Betadine scrub at hatching to avoid possible infection here. The chicks should be weighed and banded and are ready for the brooder at about 36 hours.

Artificial incubation is an art as well as a science. Experience is the best teacher as it always seems to be. But it is hoped that this information will give you a good basic start for attempting it yourself.



MANAGEMENT OF SIBERIAN LYNX

AT HOWLETTS ZOO PARK

By
Douglas M. Richardson
Senior Cat Keeper
Howletts Zoo Park
Bekesbourne Nr Canterbury, Kent, England



We received our pair of Siberian lynx (*Felis lynx wrangeli*) from a small zoo in England which specializes in the breeding of the various varieties of lynx. The male arrived in April of 1981, aged 2 years; and the female in July of the same year, aged 3. The female arrived with a litter of two, eight-week-old male kittens that had been sired by a central European male. The kittens were later euthanized as a satisfactory home could not be found for two sub-specific hybrid male lynx.

After a period of acclimation, the lynx were inoculated against viral rhinotracheitis, calici virus, and panleukopenia using a modified live virus vaccine. They were also wormed with a piperazine powder.

Since the female arrived with a litter of kittens, the male was kept in a separate part of the zoo. The male Siberian lynx cage is in three sections: the outdoor exhibit cage, the off-exhibit outdoor cage, and the indoor quarters that connect the two outside cages. The outdoor exhibit cage is 14.5 meters long, by 5.8 meters wide, by 3.7 meters high with a sand and pebble floor. The cage furniture consists of wooden shelves and ramps, connected with long branches. The off-exhibit outdoor cage is merely a smaller version of the exhibit cage, being 4.9 meters long, by 3 meters wide, by 2 meters high. For the cats to pass from one cage to the other, they have to go through the indoor area, which is a shed 2.5 meters long, by 1.8 meters wide, by 1.8 meters high. The shed is divided into three sections each connected by a slide; two of the sections are simply cubes with a shelf for the cats at the back, but the third is the area that holds a built-in catching crate that can be easily removed and is interchangeable with identical crates in all the other medium-sized cat sheds. The catching crates allows us to do away with the need to dart or net animals for a simple move to another cage. They also make excellent breeding dens for the females.

After the disposal of the young lynx, the adult male was moved on 12 January, 1982 to the exhibit cage and the female was kept separate from the male in the off-exhibit cage. The adults were able to see and smell each other, but due to the gauge of the separating wire, no physical contact was possible.

The adults took virtually no notice of each other and since there was at least no aggression we opened the dividing slide on 17 January, five days after initial introduction. Initially there was only cautious sniffing of each other and the male went through to what was the female's cage and sprayed heavily.

At the beginning of March, high pitched calling was noted from the female at night and on 5 March mating started and continued until 7 March. Mating took place at anytime of the day except when there was public in the zoo.

The male was removed to another part of the zoo on 28 April, 1982 since

MANAGEMENT OF SIBERIAN LYNX AT HOWLETTS ZOO PARK, Continued

the female had not come into heat again and had heavy abdominal swelling. Over the next few days the female's activity decreased a great deal so cleaning of the indoor area was suspended. On 16 May, the female stayed in the shed all day and from this point all servicing of the area was stopped. It was not until 19 May that she came out for food looking dramatically thinner. She took the rabbit and returned to the shed. We felt no need to check for kittens as she had obviously had them due to the reduction in her girth and the fact that she was uncharacteristically staying indoors most of the time. The gestation was 70 days.

On 10 June, 25 days after the birth, the female came out with three rotund and wobbly kittens in tow. We believe she came out then due to the removal of a barrier by the maintenance staff that we had erected to keep the public at a greater distance from the shed. When the barrier was replaced, the female took the kittens back into the shed. After this the kittens came out regularly and took no notice of the public or the keepers, though the female would become aggression incarnate when a keeper ventured near the cage for feeding or observation.

At 12 weeks of age, the kittens were inoculated and an anal swab was taken as there was a noticeable weight loss. The swab was analyzed and showed positive for salmonella. The kittens were removed and treated with a course of interamyceten for seven days. One male succumbed but the remaining pair gained weight rapidly. The adult female was also treated for salmonella with the same positive results. The source of infection was never ascertained, but we believe it stemmed from a sub-standard batch of chickens that had been fed to the cats.

In September 1982, the adult male was again introduced to the female. Mating was recorded from 25 to 28 February of 1983. They were separated on 2 May, but this time the male was kept in the exhibit cage and the female was given the adjacent off-exhibit cage.

On 7 May, 1983, the kittens were born and the female went through the same routine of remaining in the shed for most of the time. The gestation was 70 days, the same as with the last litter. She again produced a litter of 2 males and 1 female.

At 12 weeks of age, the kittens were inoculated and were moved with their mother to the exhibit cage, and the male was placed in the shut-off facility. This allowed the public to observe the behavior of the group as the female was past the over-protective stage.

The lynx are fed three times a week and are given a wide variety of food-stuffs including beef, calf, whole chickens, rabbits and pigeons. When the kittens are approximately four weeks old we multiply the amount of food put in the cage by the number of animals in the litter. We do not alter the food in any way since the female opens whole animals for the kittens and by eight to ten weeks the kittens can deal with any skin or bone they come across.

This management routine is basically the same one that we use with all the cat species at Howletts. The three areas we are mainly concerned with are a balanced diet, monitoring the females reproductive cycle, and total privacy for the female and her young. Next year we plan to allow the male to remain with the female when she has her kittens since no aggression was observed from the male towards the youngsters through the dividing wire. This method was successful with our Northern European lynx and other collections have reared young lynx with the male present.

MANAGEMENT OF SIBERIAN LYNX AT HOWLETTS ZOO PARK, Continued

It had been recorded in some zoos in Great Britain that breed lynx, that animals that are regular breeders for 4-5 seasons would, for no apparent reason, stop breeding entirely. This would happen even when there had been no change in what was a successful management routine. Breeding will only recommence when the animals had been moved to a new location, even just within the zoo.

When we acquired our Siberian lynx from the zoo that specialized in them, we stipulated that we wanted an out-bred pair. This did not cause any problems to the zoo that was selling the lynx as they had a number of unrelated animals, but it cost us an extra \$600 for the animals. In these time of awareness of the dangers of inbreeding in closed captive populations, it is sad that we should be penalized for doing the responsible thing for the long-term future of this sub-species.



WHAT'S NEW AT THE ZOO?

(A History of the Washington Park Zoo)

By
Janet McCoy, Keeper
Washington Park Zoo, Portland, OR

In its present form this is a young zoo, although it has its roots in the mid-1880's when Portland was a busy frontier city of 22,000. "Portland's First Zoo" was started at Third and Morrison downtown by a seaman turned drugist who loved animals and collected them from his seafaring friends. His drugstore often had the appearance and aroma of a pet shop. By 1887, the collection had outgrown its quarters on a vacant lot next to his store, so Richard Knight donated it to the City at the site of the present water reservoir in Washington Park. Visitors reached the zoo by foot or the cable car that traveled up S.W. Jefferson.

The first Park Keeper, who also had charge of the zoo, was Charles Meyers, and for sixteen years gave the animals his special attention. He constructed what is beleived to be the first sunken, barless cage in the world--a bear grotto which housed the grizzly and Alaskan bears which were part of the new zoo. The present bear grottos are adaptations of those original ones which Edmund Heller, an explorer and scientist, said "served as a model for all zoos for humane confinement of wild animals." A real lesson in brevity is the 1887 Superintendent of Streets report which listed three expenditures: a new road, \$2,123.88; Park Keeper salary, \$774.00; and animal food, \$57.58. There was a rapid growth of animal exhibits, and by 1894, there were 300 specimens, mostly North American species, plus a few monkeys, foreign birds and a kangaroo. Alligators, the Zoo's first reptiles, were acquired in 1895. The zoo purchased a polar bear, a leopard and its first African lion for \$1,100 from the Jabour collection at the Lewis and Clark World's Fair held in Portland. When the fair closed, the zoo obtained an Olympic elk and a pair of Yellowstone bison.

A period of decline began in 1905 when the new mayor decreed that the zoo animals be well cared for and allowed to finish out their lives and then the zoo would expire. He forgot about an animal's instinct for propagation. The Park Keeper was a gardener by trade, and World War I was in progress. Again the zoo was moved to a higher and more remote area in 1925,

WHAT'S NEW AT THE ZOO?, *Continued*

now the site of the Japanese Gardens. The zoo's budget was strained by the practice of accepting wild and domestic pets for exhibit which could be reclaimed by the owner--often in spring and returned to the Zoo in the fall. Just prior to World War II, three people owned many of the zoo's major exhibits. In 1929, the Rose Festival Court visited the bears in the grottos.

A small boost to the zoo occurred in 1938 with the hiring of Mr. Cary Baldwin as the first zoo director. He cleaned up the zoo and made some cage improvements. Hampered by a lack of funds and lack of interest of some City Council members, he left after 18 months to become the San Francisco Zoo director until his retirement.

Our second director, Arthur Greenhall, a herpetologist, added some reptiles to the collection. The problem of space to exhibit them was solved when he lined the doorways to the exhibit buildings with snake boxes. During World War II, the only exhibit of note acquired was a polar bear cub a Russian ship had captured at sea and kept in the ship's coal bin.

When Jack Marks took over as Zoo Director in 1947, expansion was impossible at the inadequate site, cages and enclosures were in poor repair, and there were numerous escapes. Only two of the bear grottos could be cleaned without going in with the animal. One man with a hose and another with a long pole as a deterrent and to poke bones from behind rocks, went in the bear cages to clean it. Needless to say, there were many hasty retreats. As late as 1959, all personnel except the Director were under a park foreman and cared for both exhibits and grounds. In two years, 110 maple trees were thinned and reduced the amount of time raking leaves. None of the small hillside cages had water or sewer connections. Cages were washed out, debris picked up and carted away. There were also many animal deaths until three veterinarians began spending more time with the animals and gained experience in recognizing symptoms before a disease took hold. They spent a great deal of their own money on the care of zoo specimens, signaling the beginning of renewed interest in the zoo. One of these vets, Dr. Theodore Reed, subsequently became the Director of the National Zoo in Washington, D.C., strengthening the good relationship between the two institutions. Through him, we acquired Bill, who became the first sire of our chimpanzee colony.

A major turning point came in 1951 when the Portland City Club adopted a study committee report recommending that a new zoo be constructed on a new site, a Zoological Society be established to further the interests of the zoo, and that a commission be formed to aid the City Council on zoo matters. The Zoo Commission was promptly appointed by the City Council, and in 1952 the Council accepted the Commission's recommendation to place a \$3,850,000 bond issue on the November ballot to finance a new zoo on the 40-acre site of the West Hills Golf Course in Washington Park. Since the Commission itself was not empowered to raise or spend money, the Portland Zoological Society came into being to promote the campaign for a new zoo. Cary Baldwin came in from San Francisco to help promote the campaign. He trained a mynah to say "Vote for the New Zoo", but to his chagrin, when the big moment came, it said "To hell with the Fire Department". Mrs. Benchley, Director of the San Diego Zoo also campaigned. Animal tent shows and parades with animals supplied by Morgan Berry were held. Unfortunately, property tax statements were distributed a few days before the election and the measure lost by 12,000 votes. The Commission and Society immediately decided to try again.

The best publicity was generated by the arrival on 13 September 1953 of Rosy, our first Asian elephant, who now holds the record of six births and

WHAT'S NEW AT THE ZOO?, Continued

three grandchildren. She was donated by Mr. Austin Flegel, who was stationed in Thailand and stipulated that she was to be named Rosy. She became the symbol for the next ballot campaign. Donations were solicited and a new enclosure, deemed adequate for three elephants, was built for her. With endorsements from civic groups, business and organized labor, a five-year levy was passed in May 1954. Actual construction began the summer of 1955. The exhibit committee developed an anticipated list of 1,655 specimens!

Partial funding for a railway was included in the original tax levy. Jack Jones, manager of the Union Depot, and Edward Miller, assistant managing editor of The Oregonian, were instrumental in obtaining donations of time, money and materials to make the Zooliner, the finest amusement train ride of any zoo in the country. The original perimeter route was later extended into other areas of the park complex, making a four-mile round-trip excursion. In 1961, the train was designated a U.S Postal Station and is the only such installation that is an official mail carrier and has its own cachet stamp.

Acquisition of animals continued during this period. Marks led penguin expeditions to Antarctica in 1957, 1958 and 1962; the first birds were kept in the Peninsula Park swimming pool until their new quarters were completed. Aspergillosis struck and major pharmaceutical laboratories expended time and money to develop a control. Many citizens offered home remedies from ground almonds to rub on the birds to sasparilla tea.

The new zoo, renamed the Portland Zoological Gardens, opened July 3, 1959 in conjunction with Portland's Centennial Year festivities. Unfortunately, increased construction costs, compounded by delays due to bad weather, forced postponement of many of the proposed facilities. Only 60 per cent of the first "master plan" was completed, forming the nucleus of the present zoo. Construction of the Children's Zoo was made possible by funds from the Society and a private donor in 1961. Donations to the Society also made possible the construction of the hospital/research facility in 1966.

Asian elephants belonging to Morgan Berry had been spending winters at the zoo for several years. Packy's birth on 14 April, 1961 obtained world-wide coverage as the first elephant birth in the U.S. in 44 years. Life magazine's nine page feature was more than allotted to the Seattle World's Fair in progress at the same time. In three weeks, a fund drive raised the \$30,000 to purchase Packy and mother Belle. Berry donated the sire, Thonglaw, and a female, Pet, to the Zoo. In October 1963, Rosy gave birth, and by 1967 there had been six elephant births at the zoo. "The Baby Elephant Walk" was the best known of the musical tunes written about them. Thonglaw died in 1974, and Packy is now the sire of new calves.

In 1971, the Portland Zoological Society assumed full management of the zoo, although the City continued to provide the funds. Subsidizing the zoo became too great for either agency, and the State Legislature passed laws to permit the zoo to come under the jurisdiction of the Metropolitan Service District (MSD) whose Board of Directors were composed of locally elected city and tri-county officials. MSD has budgetary and general supervisory control, while day-to-day operations are the responsibility of the Zoo Director. Warren Iliff, formerly with the National Zoo in Washington, D.C., has been the Director since the fall of 1975. In May 1976, the district residents approved a 5-year, \$10 million levy for zoo operations. With the change in the governing body, a contest was conducted to select a new name for the zoo. The zoo was renamed the Washington Park Zoo on 1 October, 1976.

WHAT'S NEW AT THE ZOO? *Continued*

Using funds available from the tax levy for the 1976-81 time period, the Zoo finished a number of projects large and small. In the entry plaza, a patio area was created along with construction of a snack bar, stroller rental and yellow awning arcades. The Zoo map was built by high school students, the Information Booth donated by the Friends of the Zoo, and the parrot exhibit donated by Wacker Siltronics.

A CETA project in 1978-79 transformed four sterile indoor cages into naturalistic "Night Country" exhibits and added three new small exhibits. The leopard and tiger exhibits were renovated while keepers and volunteers remodeled the clouded leopard exhibit. A new quarantine facility was constructed. A new 7/8 acre natural sand substrate elephant yard, complete with an 80,000 gallon swimming pool, a shade structure, and the world's first hydraulically operated "crush" which can immobilize an adult bull elephant, were completed in 1980. The Nursery was renovated, the interior of the Administration Building was rearranged, and the Insect Zoo was created from an old souvenir stand. A Dove Walk-through, ferret and silky chicken exhibits, and a Cascade Nature Center were additions to the Children's Zoo. The interior of the Primate House was renovated. A new orangutan exhibit, Chimpanzee Island and "flight" cages were added to the existing buildings.

In 1979, the Society became the "Friends of the Washington Park Zoo" and was restructured to better reflect its advisory role. The Metropolitan Service District merged with the Columbian Region Association of Governments and is now called Metro, and is governed by an elected Executive Director and 12 Councilors. In May 1980, voters of Metro passed two serial levies which will provide funding for the zoo operations and capital improvements through mid-1984.

Minor projects that have been completed are the Frog House, goat enclosure, dwarf rabbit barn, and sheep and opossum exhibits in the Children's Zoo. The steam engine and the Washington Park Zoo Train Station were renovated and the "Zoo/OMSI/Forestry Center bus were decorated. The Lewis and Clark, Bird, Rose and Lily Gardens have been installed. A stage was built by the Association of General Contractors for Jazz and Bluegrass concerts.

Major projects included the completion of three new maintenance buildings constructed and existing ones renovated to improve maintenance capabilities. The Cascades Stream and Pond Exhibit was funded by a bequest from Mr. William Schamoni and is the first phase of a 12-15 acre natural habitat display area. It features a quarter-mile long nature trail, otter, trout and beaver pools, a walk-through marsh, and aquariums for small stream and pond organisms. Golden eagle and great horned owl exhibits have just been installed along the trail. Lemur Island was completed this spring. The remodeled Penguinarium, due to open in October 1983, has expanded enclosed viewing areas, created better breeding facilities, and features rockwork which resembles the coast of Peru as well as a wave machine. Also due to open next spring (1984) is Dinosaur Park in the Children's Zoo. It will be a series of hands-on and other types of participatory displays about dinosaurs. Construction had begun on the "Alaska Tundra" and will display in a natural setting wolves, musk oxen, and grizzly bears along with smaller animals like lemmings, snowy owls, and marsh birds.

The zoo is in the process of a master plan update. African Plains, Elephant Museum, Chimpanzee Interpretive Room, relocation of the Children's Zoo and main entrance gate, aviary and Desert/Tropic House, and an expanded Cascades Exhibit are some of the exciting things happening in the future. As a keeper, it is an invigorating time to be actively involved in the revitalization and future plans of a dynamic zoo.



FROM GIRAFFES TO TREE KANGAROOS

By
Judie Steenberg, Keeper
Woodland Park Zoological Gardens
Seattle, WA

What do you do with an old giraffe exhibit 20' X 40' x 25'? This paper describes the ten-month-long project of turning it into a tree kangaroo exhibit from rap sessions to the introduction of animals.

No one quite remembers when the actual decision was made to build a tree kangaroo exhibit. It happened gradually after many discussions, among the Woodland Park Zoo Staff, and especially the Keepers in the North End. Tommy Wood, Sr. Keeper, and Keepers Chuck Harke, Carolyn Kennedy and Paul Goodnow all put time and effort into the project, but Keeper Gregg Thompson was the guiding force behind it all. He kept it going; it didn't occur to him it might not be possible to do certain things, he did them anyway. Matchie's tree kangaroos were chosen as the main species although it was intended to be a mixed species exhibit.

In July, 1980 the giraffes were moved from the old house to the new African Savanna exhibit. For the next 18 months the giraffe house was used to exhibit llama, maned wolves and caviies, for various periods of time. As last as January, 1982 caviies were exhibited after two truckloads of dirt, assorted logs, branches and rocks were added, Three months later it was time to begin the tree'roo exhibit.

Designing, acquiring materials and building the tree'roos exhibit was the largest project taken on by the Keeper Staff at WPZG. The work was done primarily by the North End crew with occasional help from other Zoo units and various city departments, in hauling materials, painting, heating and electrical work. The horticulture crews from the Zoo and City Conservatory also gave support in amending planter soil and supplying some of the first plants.

Nine live oak trees, six of them over 20' tall, dozens of cement blocks, yards and yards of gravel, sand and planter soil, hours and hours of labor and the usual trials and errors that go into a project of this size finally resulted in a tree kangaroo exhibit in November 1982.

Keep in mind that the Keepers who worked on this exhibit also worked on a daily routine; there were some very long days put in with voluntary overtime before it was finished.

THE EXHIBIT

After the caviies, two loads of dirt, logs and rocks were removed, the next step was to remove the metal barred panels that formed the two exhibit stalls. The screen sections of the 20' tall giraffe doors were replaced with plywood and personnel doors were cut into them for access to the back holding stalls.

In May, 1982, the City painters moved in and went to work. The colors range from brown at the ground level through various shades of green to sky blue at the top. Slight impressions of foliage were accomplished by spray painting over various plant materials to create silhouettes.

Two-inch vertical pipes for the catwalk at the front of the old exhibit were cut off and reinstalled from the ceiling joists; these would support

FROM GIRAFFES TO TREE KANGAROOS, Continued

the irrigation pipes. A most difficult task was to secure chicken wire across the entire top of the exhibit and fasten it to the rafters. Metal strips were applied all along the edges of the wire to secure it. This was done to keep the birds off of the rafters.

Meanwhile the live oak trees were being selected and tagged for the Zoo at the McCord Air Force Base, south of Seattle. It took two trips with three trucks to haul the nine trees back; the trees were being cut as a part of a clearing operation at the base. Oak was selected because of its durability and availability. Since tree'roos have a requirement for tannic acid, the tannin in the bark of the oak was not considered to be harmful to them.

By August, using block and tackle for the most part, with Keepers stabilizing the trees while they were being moved in and put into upright positions, six trees were securely anchored to the floor with steel braces bolted into the concrete. Vertical cables are attached to each upright tree to add support. A network of upright and fallen trees and branches was carefully planned to help support the trees, to provide a continuous traffic pattern for the tree'roos, and to allow for the exhibit to be sub-divided if necessary. At one point, cuscus and tree'roos were both considered for the exhibit. During the past summer the trees have dried and some cracks have appeared. These will be secured by putting bolts into the trees and counter-sinking the ends. The careful planning that went into the placement of the trees paid off. All trees are used, aggression can be avoided by a tree'roo taking another route, and the animals can move from the sun to shade as desired.

Next, dozens of cement blocks were used to build 2½-foot-deep planters along one end and the back walls of the exhibit. The front bulkhead that the vertical steel pipes were originally attached to also served as a planter. The Keepers designed and constructed six 12" square, special, fine-mesh drain covers to keep the sand out of the drains. So far they have worked quite well.

In September and October 1982, four yards of 1" river gravel were moved in by bobcat and hand-spread in the center of the exhibit and in the planters to provide drainage. Approximately four yards of soil were needed to fill the planters and 12 yards of sand were hand-spread in the center of the exhibit to an average total depth of 2½ feet from the concrete floor. The sand served as an additional support for the trees, to cushion an animal if it should fall out of a tree, and to filter out impurities. The fecal matter is picked up daily and heavy urine areas are flushed regularly.

With help from the Zoo's horticulture crew, the soil was amended in the planters and it was time for planting. About a dozen large tropical plants were dispersed along the back of the exhibit. A work party was held to collect plants; 15 Keepers from various units set out digging up clumps of bamboo, grasses and heather from undeveloped areas of the Zoo and the Zoo plant nursery. Within about 2½ hours, the exhibit was planted. Today, only the tropical plants and two clumps of bamboo remain from the original plantings. Interiors in Green, a local plant supply store that rents plants to businesses, has donated literally dozens of van loads of plants to the Zoo. Most of these plants have been planted in the tree'roo exhibit over the past nine months. They are plants that have become too big, to rangey or that are returned by customers who just want something different.

FROM GIRAFFES TO TREE KANGAROOS, Continued

Although the first few van loads had some pretty scruffy-looking plants, the quality has improved steadily throughout the year. We've received a 17-foot weeping fig, several 10 to 12-foot rubber trees, hugh schefflera (up to six feet wide), 10 to 12-foot tupidanthus, and many, many smaller plants. During this time we also received additional plants from the City's conservatory. Our Head Gardener worked closely with us identifying plants to insure that no toxic plants were put in the exhibit. At this point we have plants surrounding the sand area and have started putting live plants in the main area for the tree'roos to browse on in addition to the cut browse they receive daily. A list of the plant species we used is available upon request.

We have just about completed stage two of our three-stage planting program. First we just wanted anything green; the second stage was to have all tropical plants in the exhibit. Ultimately, we'd like to have species that are the same as or that as similar to the species found in New Guinea. While compiling that list, we'll see how well the current plants do during our low light conditions this winter.

After attaching the food and water pan holders to the trees, an electric fence was installed between the sand area and the planters, and the exhibit was ready for the tree'roos. In November, 1982 the three female tree'roos were introduced; first they were given visual access through a screen door. After a few days they were allowed to enter the exhibit from the back holding rooms on their own. The two adult females went in within a short time and immediately climbed trees, but the juvenile would only stand at the door and look. We "put" her into the exhibit after the second day. The tree'roos were allowed to return to their holding room for about four days before the door was closed.

We had a problem with the heat in the exhibit for the first month or so. We wanted to maintain about 70-75 degrees, but were falling about 5 degrees short. A separate thermostat and valve were installed and they have worked out just fine. As summer arrived it became evident that we needed to improve the air circulation in the exhibit. A larger exhaust fan was installed in the roof, and three large intake vents were added; one 30" X 36", one 18" X 36" and one 18" square. This has proven sufficient to control the summer temperatures. We try to keep it under 75-77 degrees; this is the temperature at which the tree'roos start sucking on their forelimbs and sprawl out on the branches to keep cool.

Tree Kangaroos came from rainforests and require a minimum of 50% humidity to avoid skin problems; especially scaley tail. We try to maintain a 65-75% humidity level. During the summer, the exhaust fan draws off considerable moisture requiring almost daily misting. One problem we have had with the changing seasons has been occasional fogging of the windows when we mist. We avoid heavy watering or misting just before the week-ends or else spend time squeegeeing off the windows all day. We can also drop the temperature in the exhibit up to six degrees by hand watering the walls, trees, and spraying the air and sand. Temperature and humidity readings are taken twice daily, and the night Keeper monitors the temperature by a thermometer in a window.

In May, 1983 a mortar mix facing was applied to the bricks on the back planter and a shallow pool was constructed by Walter Sonderegger, formerly of the Vancouver Aquarium. These additions have greatly improved the appearance of the exhibit and allowed us to contour the sand away from the wall. The process which utilizes fine mesh, expanded metal,

FROM GIRAFFES TO TREE KANGAROOS, Continued

mortar and finishing cement mixes, and latex paints was demonstrated to the WPZG Staff by Walter. It will be used to build a strangler fig, and shelf bracket to hide food and water pans. In July, a retaining wall was put in front of the radiators to keep the dirt from under them and up around the plants where it belonged.

The exhibit is NOT YET finished. About 85% of the second stage planting has been done with the remaining plants set in place but still in their pots. The food and water pans will be moved to the front side of the trees before they are camouflaged. This will result in the tree'roos facing the public while they eat. A small waterfall and stream with a recirculating pump is planned, as well as heated rocks for the lizards. A network of vines will be added just below the chicken wire screening before the addition of fruit bats to the exhibit. We will also be hanging live mosses from the trees and hope that the tree'roos won't eat them all. There is still work to be done in the off-exhibit holding room and an outdoor holding area is planned for the future.

THE ANIMALS

Our three female Matschie's tree kangaroos are from the Baiyer River Sanctuary in New Guinea and were captive born. Our male arrived from the San Diego Zoo after the females were already in the exhibit and was introduced in January, 1983. We have had some breeding success; last month a 2 5/8" fetus was found dead on the sand at morning check. Although we were very disappointed, it was heartening to know that our male is fertile, and that the embryo made it into the pouch. We suspect this was the first birth of the youngest adult female.

Breeding of both of the adult females has been going on the past two weeks and we will be starting regular pouch checks after a little more conditioning of the animals. One will allow her pouch to be looked into, one doesn't mind being palpated on the stomach, but the third will require much more conditioning; she hates to be touched. All four tree'roos come down to the Keepers for a monkey biscuit on morning check. We have had a few minor social problems and Kara often sits off alone while the other three are located in the same tree, quite close together. She is also the only animal to have had any medical problems; a case of scaly tail is in the process of healing.

Edward's lorries were decided on for the initial bird species for the exhibit based on their color, availability (we already had them), and the fact that they do occur in New Guinea. 3.1 were introduced and within a few hours a pair bond was started. One of the remaining males had been partially hand-raised by Keepers when his parents kicked him out of the nest when he was about two-thirds feathered out. His association with people caused him to act abnormally in the exhibit and he was ostracized by the other lorries. He took to playing with the plants and virtually destroyed a 15' Norfolk Island pine. Shortly after the pair started nesting, they attacked him and he was removed from the exhibit before he was injured.

The pair took to a nestbox above the east windows and two eggs were laid; one egg hatched. They were excellent parents and eventually the remaining odd male had to be moved for his safety. As the chick grew the adults became more and more territorial over the tree tops and the tree'roos food pans. They would actually attack the tree'roos in unison, land on their heads and bite at their ears. The attacks were sporadic and short-lived at first and no damage was done to the ears due to their thick coats.

FROM GIRAFFES TO TREE KANGAROOS, Continued

On one occasion the birds had to be chased off by spraying them with water. A decision was made to pull the adults and nestbox with the chick in it; of course, the chick fledged the very day we were to do this. He was easily recaptured and used to lure the parents into a trap cage.

At present there are 2.0 lorries in the exhibit. The hand-raised bird "Rodan" was tried with them again, but he still was odd man out. However, he is being kept as a lure for trapping the other two out of the exhibit. Last month we caught the free-flight male lorries within 35 minutes; this was the total time required to set-up the trap cage, put Rodan in it in a small cage, run the line to the trap door, catch the birds and put everything away. The birds were being caught for semi-annual exams and to cope their bills. They were in excellent flesh and plumage, and their nails did not need trimming.

By the way, the cuscus were never put into the exhibit due to their habit of eating birds.

Wombats were tried briefly, but proceeded to crawl under the hot wire (it only seems to affect them on their faces, and not on the top of the head or back). They promptly "unplanted" several areas and were moved to another exhibit.

Surplus male potoroo were kept in the exhibit from about January through May. Some plant damage occurred from their digging around the base of plants and chewing the bark of some plant species. Most plants survived as long as they hadn't been girdled, and the roots were recovered daily. The hot wire didn't keep the potoroo out of the planters due to its height; nor was it really intended to. They have since been moved to an outdoor exhibit.

Three New Guinea water dragons were added this summer and have done very well in the exhibit; even the thin lizard has plumped up the past few months. Heat lamps are provided for them at two opposite corners of the exhibit. However, they seldom use the lamps even when it's only 60-65 degrees in the exhibit. They are often seen basking on the tree limbs or sand areas on sunny days and have been quite visible to the public.

CONCLUSION

The tree'roo exhibit was dedicated January 25, 1983 by the Australian Consulate from San Francisco. We expect it will be a full two years before we finish with it. It's basically a long-term experiment that is working out very well to this point. We have learned a lot, and expect to learn much more about what will work best in the months to come.

Other species we plan to add are: fruit bats, red-crowned pigeons, red-bellied pittas, magnificent riflebirds and a turtle species. The bird species will be difficult to acquire we've been told. However, there is some chance that we will get them. They were selected based on their dietary needs, display value, vocalizations and the niche they would occupy in the exhibit. Unit Keepers did research on the species and made recommendations to the Senior Staff, which was accepted almost entirely.

All in all the tree kangaroo exhibit is a success and an excellent example of cooperative efforts from personnel throughout the Zoo Staff and City Parks departments. We hope you will be attending the 1984 AAZK Conference in Seattle next October to see how the exhibit has progressed.



RENOVATION: BRINGING A ZOO'S PAST INTO THE PRESENT

By
Michael Marshall, Keeper
Washington Park Zoo, Portland, OR

The process of renovation of Washington Park Zoo's primate facility was, in many ways, more a process of focusing than of just repairing and changing a tired building. It was a process of tearing down old concepts of how to exhibit animals and replacing them with new ideas, current animal management tools, and modern building materials. Going from basic philosophical concepts to the most convenient placement of electrical outlets represented a major commitment of time and money.

Our primate facility was originally built in 1959 when the Zoo was moved to its present location. It housed 22 indoor exhibits and one outdoor exhibit. The largest exhibit was 308 square feet (the orangutan exhibit) and they ranged on down in size. Like many facilities of the times, one major consideration was to allow the visitor to view the animals as closely as possible and the best way to do that was in a small exhibit. All climbing structures were made of steel and painted in bright colors, as were the exhibit walls themselves. The outdoor moated exhibit had an extensive steel climbing structure that was also brightly colored. On nice days, doors protecting the top half of the north and south side exhibits could be rolled up. Visitors could then view the animals from an elevated walkway.

Over the years, several design flaws became apparent and limited the effective usefulness of the facility to visitors, animals and keepers. The elevated walkway was a problem because visitors could get next to the mesh and hand harmful objects to the monkeys. Also, controlling the animals' diets was impossible. For this reason, the upper walkway had to be closed. The colorful paint had also been chipped off a large percentage of all climbing structures, amplifying the hardness of the exhibit.

Exhibit size was probably the most important limiting factor as far as the usefulness of the facility to the primates themselves. All young animals were routinely pulled from their family groups at around one year, chiefly because of lack of space. Another design problem that had proven disastrous to the animals had been the outdoor Sykes monkey island exhibit. It was designed with only a small holding facility. Because they proved not to be tolerant of Oregon weather, animals had to be housed in these small quarters during the winter months to avoid frostbite. Without sufficient shade, the extensive concrete and steel climbing apparatus was too hot to be utilized much during the summer months. This exhibit had been totally altered to become a pool for harbor seals prior to renovation.

The biggest limitations for daily animal maintenance were the holding cages. With the exception of separate small holding cages for the adult chimps and orangutans, all primates housed in indoor exhibits used the same holding area. Sanitation and stress, due to the close proximity of other species, were problems.

In 1976, a Zoo capital improvement bond levy was approved by the voters and renovation of the primate facility was a major priority. Sheldon, Eggleston, Reddick, and Associates was the architectural firm chosen for the project. Their task was to design a primate facility which would utilize the existing buildings, overcome the original design limitations, and include new outdoor enclosures emphasizing the Zoo's trend towards creating more natural habitats for viewing and housing animals.

RENOVATION: BRINGING A ZOO'S PAST INTO THE PRESENT, Continued

Lengthy meetings were held several times per week between Zoo staff and architects. Keepers visited other facilities and corresponded with other keepers to incorporate proven good ideas into this facility. The importance of keeper input at this stage cannot be overly stressed.

A major goal was to aesthetically soften the building and put it in as natural setting as possible. This was done mostly with the use of extensive plantings and wood. Planters were installed in front of the south-facing exhibit row. Bamboo and other densely foliated plant species were planted around all exhibit barriers and outer walls of the building. The building was also painted a forest green. All outside exhibits and the orangutan exhibit have large grassy areas. Gunnite rock work was put in both the outdoor chimp and ring-tailed lemur exhibits. Viewing areas were placed so as to provide differing views of each exhibit. Climbing structures were replaced with interlocking wood poles. The ceiling in front of the indoor chimp exhibits was sound-proofed and finished with wood. Another section, containing many small reptile and amphibian exhibits, was opened up and planted with six 10-foot ficus trees.

A major feature designed into the new facility was a separate holding cage area for each group of animals. The elevated visitor walkway was enclosed, divided into rooms, and each area outfitted with a long, stainless steel mesh cage. Guillotine doors divided each into eight compartments with a built-in squeeze cage in each area. Both indoor chimp exhibits had stainless steel holding facilities added as did the new orangutan exhibit. The chimpanzee and orangutan holding areas were equipped with hydraulically operated doors to divide each area into smaller compartments. New climbing structures and nest platforms were installed in the two indoor chimp viewing rooms and all were constructed of stainless steel to facilitate cleaning.

The building was also organized according to the environmental needs of each species. Primates more able to tolerate the Oregon climate are housed on the north side. Primates requiring climate-controlled environments are housed on the south side. Orangutans were given a separate climate-controlled exhibit.

Another major design goal was to increase the size of each exhibit. Dividing walls were knocked down along the south side and the number of exhibits in the same space dropped from nine to four. Five small prosimian exhibits became three marmoset exhibits. Three outdoor exhibits were built with access to the inside north side exhibits via a transfer chute. These chutes pass through the holding areas and are directly above the visitor walkway but out of public sight. A quarter-acre moated outdoor chimp yard was built in an undeveloped area immediately west of the building. This connects with the two indoor chimp viewing rooms. A hydraulically operated solid door and a removeable mesh partition were added to the dividing wall of the two indoor chimp rooms. This feature is very important when introducing two groups of chimps that haven't been together before. An outdoor ring-tailed lemur exhibit was constructed over the east side seal pool and an enclosed holding area was also added where a sun porch had previously been located.

Actual construction began on 19 March, 1980 and was completed in May of 1981, with the exception of the lemur exhibit which was finished in late October 1982. Humphrey Construction Co. did the renovation. The total cost of the renovation was \$2,041,215. Forty-one changes had to be made in the original bid. Changes ranged from repairing damaged insulation to

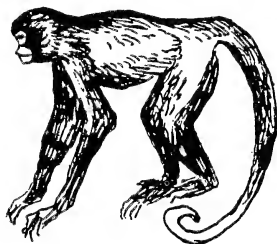
RENOVATION: BRINGING A ZOO'S PAST INTO THE PRESENT, *Continued*

raising the chimp moat wall up to six feet in some areas.

Considering the complexity of the project, design problems at this facility have been minimal and have been corrected as they appear. The planters in the three marmoset exhibits were removed because the soil in them proved to be a vector for disease. After new climbing poles were installed in the indoor chimp exhibits, the male was able to break windows. By swinging off the poles closest to the windows during his displays, he would build up enough momentum to break windows, even much thicker ones than before. The poles were altered, two were removed, and the breaking of windows has stopped. The moat around the outdoor chimp exhibit proved to be too narrow and the outer wall had to be raised to increase the distance between the walls.

The advantages of the new facility are very clear. An injured animal does not automatically have to be sent to hospital facilities. It can instead be housed in all or part of the holding area and keep visual and tactile contact with its group. The increased size and complexity of the exhibits helps to minimize aggression and increases in group size are not a problem. In many viewing areas, visitors can see primates close up with only tempered glass as a barrier. As plantings mature, barrier walls and the building itself will recede into the background.

The renovation enabled Washington Park Zoo to go from a primate facility with the emphasis on displaying a maximum number of species in a minimum amount of space to a facility with fewer species displayed in a more natural setting. The end result is a building that is practical from an animal management point of view, spacious for the animals, and aesthetically pleasing to Zoo visitors.



LIMITED EDITION

SPECIAL COMMEMORATIVE AKF TENTH ANNIVERSARY T-SHIRT

ANIMAL KEEPERS' FORUM



Dedicated to Professional Animal Care

TENTH ANNIVERSARY

1974 - 1984

AKF will be ten years old in October 1984. To commemorate ten years of continuous publication, a special T-shirt is being issued.

The Puget Sound AAZK Chapter has taken this on as a fund-raising project for the 1984 AAZK Conference. All profits will benefit the Conference and AKF.

The T-shirts will only be available from October 1983 through October 1984. A check must accompany your order. Please allow 3-4 weeks for delivery. The price of \$7.50 each includes postage and handling. The shirts are 100% cotton; if you wash or dry at high temperatures, order a size larger.

AKF COMMEMORATIVE T-SHIRT ORDER FORM

NAME: _____

ADDRESS: _____

Color choice: powder blue beige

Size: Small Medium Large Extra Large

Make checks payable to: The Puget Sound AAZK Chapter Conference Account
Mail to: Woodland Park Zoological Gardens, 5500 Phinney Ave., N., Seattle,
WA 98103.

TOTAL AMOUNT ENCLOSED \$ _____

INDEX FOR VOLUME X, NUMBERS 1-12, 1983

AMERICAN ASSOCIATION OF ZOO KEEPERS

Grants Committee Changes Announced	Jan 1
New AAZK Board Member Named	Jan 1
Continuing Keeper Education (CKE)	Jan 4
AAZK Accessories Available	Jan 35
Assistance Sought by Professional Standards Committee (PSC)	Jan 40
Assistance Sought in PSC Survey	Feb 41
Delayed Address Changes Costly to Association	Feb 41
AAZK T-Shirt Order Form	Feb 50
AAZK Board Approves New Committee Appointments	Mar 65
Continuing Keeper Education (CKE)	Mar 68
Assistance Sought by PSC	Mar 72
Nominations Procedures for AAZK Board of Directors	Mar 77
1983 AAZK Conference/First Call for Papers	Mar 84
V.P. Resigns; Replacement Named to AAZK Board	Ap 101
National Elections Chairman Named	Ap 101
CKE--Animal Husbandry Manual Review	Ap 105
Assistance Sought by PSC	Ap 105
Request for Nominees for AAZK Awards	Ap 106
AAZK Research/Grants Guidelines	Ap 122
AAZK Announces New Publication--Biological Values	Ap 130
AAZK Accessories Available	Ap 131
1983 AAZK Conference/Second Call for Papers, Notes, Tentative Schedule of Events	Ap 132
1983 AAZK Conference Registration & Hotel Reservations Forms	Ap 133
Animal Data Transfer Form (ADT)	Ap 134
ADT Survey Request	Ap 135
The State of the Association	May 141
AAZK Income Statement	May 143
Keeper Hotline Seeks Volunteers	May 146
Conference/Second Call for Papers, notes, tentative schedule	May 166
AAZK Conference Registration & Hotel Reservation Forms	May 167
Final Call for Papers for 1983 AAZK National Conference	Ju 196
1983 AAZK Conference Registration, Important Notes	Ju 196
AAZK Conference Registration & Hotel Reservation Forms	Ju 197
Assistance Sought in PSC Survey	Ju 171
New "Zookeeping as a Career" Brochure Available	Jul 201
Connie Cloak Moves to Nashville	Jul 201
Reminder from National AAZK Elections Committee	Jul 203

ADT Form Coordinator Moves to Topeka	Jul 201
Keeper Data Survey	Jul 231
Education Committee Requests Member Input	Aug 233
From the President--Nat'l Conference Board of Director's Schedule	Aug 233
CKE--China Exchange/Training Materials Request	Aug 238
Election Reminder	Aug 244
Conference '83 Schedule	Aug 263
'83 Conference Registration Forms	Aug 263
CKE--Exhibit Design Form Project	Sept 271
'83 Conference Registration Forms	Sept 292
NEC Announces New AAZK Board Members	Oct 297
Three Named to Education Committee	Oct 297
1983 AAZK/AKF Awards	Oct 298-99
CKE--Staff Exchange Update	Oct 303
Infant Development Project Update (IDP)	Oct 312
From the President--'83 Conference Comment	Nov 325
CKE--Safety Video Tape/ Education Committee Questionnaire	Nov 329
Riverbanks Chapter to Host Regional	Nov 345
AAZK Board of Directors Revises International Membership Fees	Dec 353
An Open Letter to AAZK from Ed Roberts	Dec 353
From the President...Chapter Affairs Coordinator	Dec 354
CKE--Special Session on Staff Training at AAZPA Conference	Dec 357
In Vancouver	Dec 357
Overview of the 1983 AAZK Board of Director's Annual Meeting	Dec 359

ANIMAL KEEPERS' FORUM

From the Editor's Desk--Special Elephant Issue	Jan 1
AKF Names New Associate Editor	Mar 65
Letters to the Editor	Aug 234
	Sept 269
AKF Journalism Awards	Oct 298
Statement of Ownership and Circulation	Nov 349

ANIMAL KEEPERS' FORUM (continued)

AKF Anniversary T-Shirt Order Form	Nov 351
From the Editor's Desk... Conference Issue	Dec 353
<u>SCOOPS AND SCUTTLEBUTT</u>	
From the Editor's Desk-- Special Elephant Issue	Jan 1
Grants Committee Changes	Jan 1
New AAZK Board Member Named	Jan 1
Assistance Sought by PSC	Feb 41
Delayed Address Changes Costly to Association	Feb 41
Members Urged to Assist in Survey Requests	Feb 41
AAZK Board Approves New Committee Appointments	Mar 65
AKF Names New Associate Editor	Mar 65
Gestation Booklet Information Requested from Members	Mar 65
V.P. Resigns; Replacement Named to Board	Ap 101
National Elections Committee Chairman Named	Ap 101
Primatologists Meeting Plans Roundtable Discussion	Ap 101
1982 Toronto AAZK T-Shirts Still Available/Conference Photos Sought by Committee	Ap 101
Oliver Claffey Named New KAL Coordinator	May 137
Keeper Category to Again be Considered by AAZPA	May 137
Assistance Sought by PSC	May 138
From the President--Ed Roberts Retirement	May 138
AAZK Board Approves New PSC Member	Ju 169
June Declared National Zoo and Aquarium Month	Ju 169
Assistance Sought in PSC Survey Request	Ju 171
New "Zookeeping as a Career" Brochure Available	Jul 201
Connie Cloak Leaves Topeka Zoo for Nashville	Jul 201
ADT Form Coordinator Moves to Topeka Zoo	Jul 201
Riverbanks Chapter Donates Funds for Career Brochure	Aug 233
Education Committee Requests Member Input	Aug 233
From the President--Nat'l Conference Board Schedule	Aug 233
Biological Values/Gestation Committees Merge	Sept 265

SCOOPS AND SCUTTLEBUTT (continued)

Change of Address Reminder to Membership	Sept 265
Riverbanks Chapter to Host First AAZK Regional	Oct 297
NEC Announces New AAZK Board Members	Oct 297
Three Named to Education Committee	Oct 297
From the President--'83 Conference Comments	Nov 325
From the Editor's Desk... Conference Issue	Dec 353
AAZK Board of Director's Revises International Membership Fees	Dec 353
An Open Letter to AAZK from Ed Roberts	Dec 353
<u>KEEPER NEWS/ZOO NEWS</u>	
CKE--Reviewing Existing Training Manuals	Jan 4
Keeper's Alert--Animal Data Transfer Forms	Jan 19
Milwaukee Chapter Presents Reptile Demos	Feb 45
Fund-Raiser Idea Stresses Good Health	Feb 56
Staff and Technology Exchange Survey	Feb 60
Polar Bear Survey	Feb 61
CKE--Project Update	Mar 68
Cookbook Sales to Benefit Rehabilitation Program	Mar 92
CKE--AAZPA Husbandry Manual Review	Ap 104
Holiday Bonus at Philadelphia Zoo	Ap 129
CKE--China Exchange	May 145
Keeper Hotline Seeks Volunteers	May 146
Zoo News from Japan-- Birth of Black Wolves	May 155
Call for Papers for Elephant Workshop	May 155
THINK Safety!	May 165
Keeper Education at the Toledo Zoo	Ju 173
Keeper's Alert/Tips for Bats	Ju 180
A Second Look at Africa	Ju 189
Tropic World/ Asia Opens at Brookfield Zoo	Ju 192
Keeper Data Survey Form	Ju 199
Education Committee Update	Jul 205
THINK Safety!	Jul 218
CKE Column	Aug 238

KEEPER NEWS/ZOO NEWS (continued)

Keeper's Alert/Special		U.S. Proposed Positions on CITES Agenda	Ap 127
Session on Professional		Items	Ap 127
Training in Zoos	Aug 241	Proposal to List Foreign Mammals as	
A Zoological Park With		Endangered Species	May 156
Nature as its Director	Aug 242	Proposed Rule to Reclassify North	
Revitalization Plan Approved		American Peregrine Falcons	May 156
for Atlanta Zoo	Sept 272	Notes From Ecology, U.S.A	May 157
Forming a Chapter at		Proposal to List U.S. Breeding Popu-	
Lafayette Zoological Park		lation of Wood Stork as Endangered	May 157
	Sept 279	Proposal to Remove Red, Eastern Gray	
THINK Safety!/Cartoon	Oct 308	and Western Gray Kangaroos from the	
Zoo News From Japan/		U.S. List of Endangered Species	
Clouded Leopard Births	Oct 314		Ju 187
CKE--Safety Video Tapes	Nov 329	Wyoming Toad Proposed as Endangered	
Riverbanks to Host AAZK			Jul 223
Regional Conference	Nov 345	Recovery Plans for Laysan Duck, Sonoran	
Attention: TV Worth Watching		Pronghorn Approved	Jul 223
	Nov 346		
New Officers at San Diego	Nov 349	1983 Appropriations	Jul 225
CKE--Special Session on Staff		Endangered/Threatened Species Listing	
Training at AAZPA Conference		and Priority Guidelines	Aug 257
In Vancouver	Dec 357	Background on Listing and Recovery	
		Priority Guidelines	Aug 257

LEGISLATIVE NEWS

AAZPA Successfully Obtains Exempt-		Department of Trade Proposed	
ion to Lab Animal Research Bill			Aug 260
	Jan 23	Green Sea Turtle Transshipment	
House Subcommittee Holds Hearing on		Regulations	Sept 283
Captive Propagation of Wildlife		Outcome of CITES Meeting	Sept 283
	Jan 23	Petitions to List Gulf of Cali-	
Monitor Gecko Listed as Endangered		fornia Harbor Porpoise	Sept 284
	Jan 24	International Union Lists	
Expired Proposals Withdrawn From		Endangered Invertebrates	Sept 284
Listing Consideration	Jan 24	More California Condro Chicks	
Pine Barrens Treefrog Removed From		Hatched in Captivity	Sept 285
Endangered Species List	Jan 24	Final Rule to Allow Purchase,	
Proposed Additions to CITES Appendices	Feb 57	Sale and Barter of Captive-	
Implementation of Fish and Wildlife		Bred Raptors	Sept 286
Conservation Act of 1980/Final Rule	Feb 58	USFWS Lists 17 Foreign Reptiles	Oct 316
	Feb 59	U.S. Establishes Panel to	
Review of Special Rules on Sea Turtles		Protect Grizzlies	Oct 316
CITES Amendments Proposed by USFWS	Mar 89	CITES Lists Amendments	Oct 317
Notice Lists Candidate Vertebrate		Wetlands Protection Proposed	Oct 319
Species	Mar 90	Utah Prairie Dog Proposed for	
Porposed Listing of 17 Species of		Reclassification	Nov 339
Foreign Reptiles as Endangered		USFWS Reclassifies Arctic	
or Threatened	Mar 90	Peregrine	Nov 340
Condor Update/Research and captive		Beaver Impact on Aquatic and	
Propagation Efforts Widened	Mar 91	Forest Ecology Profound	Nov 340
Endangered Species Act Listing Review	Ap 125	Experimental Permits Sought for	
Reopening of Comment Period for 5-Year		Coyote Pesticide	Nov 341
Notice of Status Review	Ap 126	Changes Proposed in Listing	
Proposal to Allow Purchase, Sale and		Procedures	Dec 376
Barter of Captive Bred Raptors	Ap 126	Bald Eagle Making Strong	
		Recovery	Dec 377

BOOK REVIEWS

Wild Elephants in Captivity	Jan 12
The Rat: A Study in Behavior	Feb 63
The Spotted Hyena: A Study of Predation and Social Behavior	Mar 81
Nature Discoveries With a Hand Lens	Ap 123
Restraint and Handling of Wild and Domestic Animals	May 148
Mountain Sheep: A Study in Behavior and Evolution	Ju 184
Portraits in the Wild	Jul 214
The Life of Plants	Sept 276
The Camel: Its Evolution, Behavior and Relationship with Man	Oct 315
Lion's Share	Nov 342

TOOTH TALK

Prairie Dog Dentition	Feb 52
-----------------------	--------

FEED BAG

Grain as a Cause of Acid Indigestion in Ruminants	Aug 240
---	---------

EDUCATION

University of the Pacific Offers African Afaari for College Credit	Feb 46
CKE--Project Update	Mar 60
CKE--Review of AAZPA Manual	Ap 104
CKE--China Exchange	May 145
CKE--Keeper Education at the Toledo Zoo	Ju 173
CKE--Committee Update	Jul 205
CKE--Training Manual Request and China Exchange Update	Aug 238
CKE--Exhibit Design Project	Sept 271
THINK Safety!	Sept 278
CKE--Staff Exchange Update	Oct 303
Training Experiences at the Jersey Wildlife Preservation Trust	Oct 309
THINK Safety!	Oct 308
CKE--Safety Video Tape and Education Committee Questionnaire	Nov 329
The College of African Wildlife Management	Nov 343

EDUCATION (continued)

National Wildlife Rehabilitation Association Offers Grants	Nov 346
CKE--Special Session on Staff Training at AAZPA Conference In Vancouver	Dec 357

CONSERVATION

Hillkeeper Peepers	Feb 53
Captive Rearing of Barn Owls at the Memphis Zoo	Mar 73
Summary of Events of the 1983 Giant Panda Breeding Season at NZP	May 159
Two Condor Chicks Hatched in Captivity	Ju 186
Bats Remain in Jeopardy	Ju 187
Hand-raising Blackfoot Penguins at the Riverbanks Zoo	Ju 181
A Unique Zoo in Chiapas, Mexico	Jul 215
Why Save Bats?	Aug 246
Captive Breeding May Be Last Hope For Manatees	Aug 256
Successes in 1983 Panda Breeding Season Outweigh Death of Cub	Sept 286
The Digit Fund--Will the Mountain Gorilla Survive?	Sept 287
Condor Update	Oct 230
The College of African Wildlife Management	Nov 343

RESEARCH

Staff and Technology Exchange Survey	Feb 60
Polar Bear Survey	Feb 61
Echidna Study at Topeka Zoo	Mar 95
Research Grants Available/Application Guidelines	Ap 122
Animal Data Transfer Form Survey	Ap 135
A Guide To Getting Started In Research	May 161
Keeper Data Survey	Ju 199
Adjustment Process of African Elephants to a Novel Situation	Jul 207
Development of Captive-Born, Maternally-Reared Sloth Bears	Jul 222
Keeper Data Survey	Jul 231
Mixed-Species Survey Request	Aug 145

INFORMATION REQUESTS (Continued)

The Care and Reproduction of the	
Giant Day Gecko	Aug 248
The Digit Fund--Will the Mountain	
Gorills Survive?	Sept 287
Condor Update	Oct 320
Breeding the Coati Mundi at the	
Atlanta Zoo	Nov 337

INFORMATION REQUESTS

Polar Bears/reproductive biology	Jan 34
Animal Diets	Jan 34
Black Leopard/pelage coloration	Feb 54
Tree Shrews	Feb 54
Paro Virus in Primates	Feb 54
Maribou Stork	Feb 63
Ectoparasites from Reptiles/ Specimen Request	Feb 63
Orphan Crow	Feb 63
Undernutrition in Wild-caught Primates	Mar 93
Paramune-6 Vaccine	Mar 63
Ectoparasites in Reptiles	Mar 93
Maribou Stork	Mar 93
Paro Virus in Primates	Mar 93
Homeless Piglet	Ap 110
Asian small-clawed Otter	Ap 110
Primate Birth Control Techniques	Ap 110
Lost/Removed Tooth Specimens	May 150
Chamaeleonidae Species	May 150
Nile Hippo	May 150
Humboldt Woolly Monkey	May 150
Yorkshire Piglet	May 150
Primate Birth Control	May 150
African Hornbill	May 150
Red-bill Hornbill	May 150
Asian Small-clawed Otter	May 153
Ectoparasites in Reptiles	May 153
Animal Diets: Old World monkeys, Apes, Bears, Cats, Asian elephants, black rhinoceros, birds of prey, Psittacines	Ju 174
Reintroduction of Malayan Sun Bear and Sloth Bear mother with cubs to their exhibit mates	Ju 174
Information for Comparative Study of Psittacine baby formulas	Ju 174
Hair Loss in Brown Bear Cubs	Ju 214
Slides of North American Wildlife Requested	Aug 239
Mississippi Kite	Aug 239
Aquatic Snakes	Aug 239
Ectoparasites in Reptiles	Aug 239

White-cheeked Gibbon Exhibit	Sept 275
Golden Eagle Release Program	Sept 275
Diets for Asian Elephants	Oct 311
White-cheeked Gibbon Exhibits	Oct 311
Pygmy Marmosets	Nov 347
Palm Civet	Nov 347
Pygmy Marmosets	Dec 386
Palm Civet	Dec 386
Diabetes in Big Cats	Dec 386

PUBLICATIONS AVAILABLE

Wildlife Rehabilitation Symposium Proceedings	Jan 30
1982 AAZPA Proceedings	Jan 30
Biological Values for Selected Mammals	Mar 99
	Ap 131
Complete Guide to Snakes of Florida	May 160
Help for Hooked Birds	May 160
The Care and Feeding of Orphan Song and Garden Birds	May 160
Development of Captive-born, Maternal- ly reared Sloth Bear Cubs	Jul 222
Applied Behavioral Research	Sept 280
Recent Publications in Natural History	Sept 280
Gorilla Bibliography	Nov 348
Assorted Books from Dee Collection	Nov 348
Visitor's Guide to National Wildlife Refuges	Dec 397

1983 AAZK CONFERENCE

First Call for Papers/Sketch of Philadelphia Zoo	Mar 84
1983 Conference LOGO	Mar 85
Second Call for Papers/Notes/ Tentative Schedule	Ap 132
Registration/Hotel Reservation Forms	Ap 133
	May 167
	Ju 197
	Jul 228
	Aug 263
	Sept 292
Final Call for Papers	Ju 196
Individual Event Registration	Jul 222
AIRCORP Listing of Available Flight Cities	Aug 229
	Sept 293
From the President/Invitation to Attend Board Meetings	Aug 233
From the President/Conference Comments	Nov 325

MISCELLANEOUS

Winter Zoo Keeping	Mar 88
Death and Birth in the Rain--	
A Eulogy	Mar 98
Policy Is The Best Policy	
	May 164
A Second Look at Africa	Ju 189
First Flight	Ju 194
The Zoo System (cartoon)	Jul 213
A Unique Zoo in Chiapas, Mexico	
	Jul 215
Believe It Or Not!	Jul 217
Mourning the Death of a	
Hand-Raised	Aug 247
What's Cooking at the Zoo?	
	Oct 306
Primatologists Meeting Recap	
	Oct 314
Fly Repellant From the Spice Rack	
	Nov 347

THIRD ANNUAL ELEPHANT WORKSHOP

Elephant Care at Sedgwick County	
Zoo	Jan 6
Elephant Dialogue	Jan 14
Elephant Accident Investigation	
Process	Jan 18
A Discussion of an Ankle Abnormal-	
ity in a Young African Elephant	Jan 20
Building a Safe, Long-term Ele-	
phant Breeding Facility at the	
Calgary Zoo	Jan 25
A Management/Maintenance Program	
for Older Elephants in	
Milwaukee	Jan 28
Captive Elephant Management	
Program Survey	Jan 31
Springfield Hosts National	
Elephant Seminar	Jan 36

1983 AAZK NATIONAL CONFERENCE PAPERS

Using Empathy As A Tool in Animal	
Care	Dec 366
Readapting a Tropical Species	
To The Tropics	Dec 370
Talking Zookeeper Blues	
(Reprise)	Dec 374
Zookeeping Girl	Dec 375
Beneficial Aspects of Photographic	
Documentation of Captive Wild-	
life By Animal Keepers	Dec 379
Maternal Behavior and Infant	
Development of the Lowland	
Gorilla at Metro Toronto Zoo	Dec 387
The Birth and Development of a	
Lar or White Handed Gibbon	Dec 392
Historical Changes in Zoological	
Management	Dec 398



How I Spent My Summer Vacation	
	Dec 403
So You Want To Be A Star	Dec 406
Animals in Education	Dec 408
<u>Coendou prehensilis</u> : A Comparison	
To Other New and Old World	
Porcupines	Dec 410
Artificial Incubation of	
Bird Eggs	Dec 418
Management Of Siberian Lynx At	
Howletts Zoo Park	Dec 424
What's New At The Zoo? (A History	
of Washington Park Zoo)	Dec 426
From Giraffes To Tree Kangaroos	
	Dec 430
Renovation: Bringing A Zoo's Past	
Into The Present	Dec 435

1983 AKF PAPERS INDEXED BY MONTH

Elephant Care at Sedgwick County Zoo	A Guide to Getting Started in	
Jan 6	Research	May 161
Elephant Dialogue	Jan 14 Policy Is The Best Policy	May 164
Elephant Accident Investigative	A Simple, Effective Method of Elim-	
Process at K.C. Zoo	inating Leeches of Captive	
Jan 18	Turtles	Ju 175
A Discussion of an Ankle Abnormality	Jan 20 Mammal Anticipatory Chart	Ju 178
in a Young African Elephant	Jan 25 Hnad-Raising Blackfoot Penguins at	
Building a Safe, Long-term Elephant	the Riverbanks Zoo	Ju 181
Breeding Facility at the Calgary	Jan 25 A Second Look at Africa	Ju 189
Zoo	A Management-Maintenance Program for	
Older Elephants in Milwaukee	Adjustment Process of African	
Jan 28	Elephants to a Novel Situation	Jul 207
Captive Elephant Management Program	A Unique Zoo in Chiapas, Mexico	
Survey	Jan 31	Jul 215
Springfield Hosts National Elephant	A Handmade Blowgun Dart: Its	
Seminar	Jan 36 Preparation and Application	
A Case Study of Urinary Tract Problems	In a Zoological Park	Jul 219
In a Male Cheetah	Feb 44 A Zoological Garden With Nature	
Cannibalism in Captive Cobras	as its Director	Aug 242
Feb 48	Aberrant Nesting Behavior	Aug 244
Management and Breeding of Green	Why Save Bats?	Aug 246
Heron at the Louisiana Purchase	Care and Reproduction of the	
Zoo	Feb 49 Giant Day Gecko	Aug 248
Hillkeeper Peepers or Urine-for-Life	Chelonian Nutrition	Sep 274
(A Fine Art)	Feb 53 Forming A Chapter at Lafayette	
National Zoological Park To Open	Zoological Park	Sep 279
Monkey Island Paradise in Spring	Feb 55 Successes Outweigh Death of Cub	
Maintenance of the Eastern Coral	During 1983 Panda Breeding	
Snake on an Artificial Diet	Season at NZP	Sep 281
Mar 69	The Digit Fund--Will the Mountain	
Captive Rearing of Barn Owls	Gorilla Survive?	Sep 287
at the Memphis Zoo	Mar 73 <i>Giraffa Camelopardalis</i>	Oct 305
The Use of Clear Strip Curtains as	Training Experiences at the Jersey	
Weather Barriers for Zoo Animals	Wildlife Preservation Trust	
Mar 78		Oct 320
Grass Roots Genetics...Part 3	Those Crazy Cranes	Nov 331
Animal Breeding	Mar 86 Breeding the Coati Mundi at the	
Echidna Study at the Topeka Zoo	Atlanta Zoo	Nov 337
Mar 95	The College of African Wildlife	
A New Home for Tamarins at the	Management	Nov 343
Greater Baton Rouge Zoo	Ap 109 Using Empathy As A Tool in Animal	
Grass Roots Genetics...Part 4	Care	Dec 366
Pedigrees	Ap 112 Readapting a Tropical Species	
Repair of the Plastron of an Ornate	to the Tropics	Dec 370
Box Turtle Using a Rapid Poly-	Talking Zookeeper Blues	Dec 374
merizing Polyester Resin	Ap 115 Zookeeping Girl	Dec 375
Waterfowl Breeding Program in the	Beneficial Aspects of Photographic	
Birmingham Zoo	Documentation of Captive Wild-	
1982 Reptile Breeding Records at the	life by Animal Keepers	Dec 379
California Alligator Farm	Maternal Behavior and Infant	
May 148	Development of the Lowland	
For The Time She Was With US	May 151 Gorilla at Metro Toronto Zoo	
Elephant "Weigh-In" at Sedgwick		Dec 387
County Zoo	May 154	
A Long-Awaited Birth of Black Wolves	The Birth and Development of the	
at the Osaka Zoo	May 155 Lar or White Handed Gibbon	
Summary of Events of the 1983 Giant		Dec 392
Panda Breeding Season at NZP	Historical Changes in Zoological	
May 159	Management	Dec 398

PAPERS INDEXED BY MONTH, (continued)

How I Spent My Summer Vacation	Dec 403
So You Want To Be A Star	Dec 406
Animals In Education	Dec 408
<i>Coendou prehensilis</i> : A Comparison to Other New and Old World Porcupines	Dec 410
Artificial Incubation of Bird Eggs	Dec 418
Management of Siberian Lynx at Howletts Zoo Park	Dec 424
What's New at the Zoo? (A History of Washington Park Zoo)	Dec 426
From Giraffes to Tree Kangaroos	Dec 430
Renovation: Bringing a Zoo's Past Into the Present	Dec 435

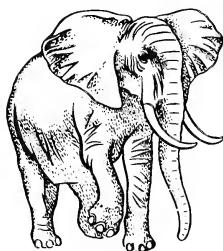
PAPERS INDEXED BY SUBJECT

MAMMALS

Elephant Care at Sedgwick County Zoo	Jan 18
Elephant Dialogue	Jan 14
Elephant Accident Investigative Process at K.C. Zoo	Jan 18
A Discussion of an Ankle Abnormality in a Young African Elephant	Jan 20
Building a Safe, Long-term Elephant Breeding Facility at the Calgary Zoo	Jan 25
A Management-Maintenance Program for Older Elephants in Milwaukee	Jan 28
Captive Elephant Management Program Survey	Jan 28
Springfield Hosts National Elephant Seminar	Jan 31
A Case Study of Urinary Tract Problems in a Male Cheetah	Feb 44
Hillkeeper Peepers or Urine-for-Life (A Fine Art)	Feb 53
National Zoological Park to Open Monkey Island Paradise In Spring	Feb 55
Echidna Study at the Topeka Zoo	Mar 95
A New Home for Tamarins at the Greater Baton Rouge Zoo	Ap 109
For The Time She Was With US	May 151
Elephant "Weigh-in" at Sedgwick County Zoo	May 154
A Long-awaited Birth of Black Wolves at Osaka Zoo	May 155

MAMMALS, (continued)

Summary of Events of the 1983 Giant Panda Breeding Season at NZP	May 159
Mammal Anticipatory Chart	Ju 178
Adjustment Process of African Elephants to a Novel Situation	Jul 207
Why Save Bats?	Aug 246
Successes Outweigh Death of Cub During 1983 Panda Breeding Season at NZP	Sep 281
The Digit Fund--Will the Mountain Gorilla Survive?	Sep 287
<i>Giraffa camelopardalis</i>	Oct 305
Breeding the Coati Mundi at the Atlanta Zoo	Nov 337
Readapting a Tropical Sepcies To the Tropics	Dec 370
Maternal Behavior and Infant Development of the Lowland Gorilla at Metro Toronto Zoo	Dec 387
The Birth and Development of the Lar or White Handed Gibbon	Dec 392
<i>Coendou prehensilis</i> :A Comparison to Other New and Old World Porcupines	Dec 410
Management of Siberian Lynx at Howletts Zoo Park	Dec 424
From Giraffes to Tree Kangaroos	Dec 430



BIRDS

Management and Breeding of Green Heron at the Louisiana Purchase Zoo	Feb 49
Captive Rearing of Barn Owls at the Memphis Zoo	Mar 73
Waterfowl Breeding Program at the Birmingham Zoo	Ap 117
Hand-Raising Blackfoot Penguins at the Riverbanks Zoo	Ju 181
Aberrant Nesting Behavior of Those Crazy Cranes	Nov 331
Artificial Incubation of Bird Eggs	Dec 418



HERPETILES

Cannibalism in Captive Cobras	Feb 48
Maintenance of the Eastern Coral Snake on an Artificial Diet	Mar 69
Repair of the Plastron of an Ornate Box Turtle Using a Rapid Polymerizing Polyester Resin	Ap 115
1982 Reptile Breeding Records at the California Alligator Farm	May 148
A Simple, Effective Method of Eliminating Leeches in Captive Turtles	Ju 175
Care and Reproduction of the Giant Day Gecko	Aug 248
Chelonian Nutrition	Sep 274



EDUCATION

Elephant Accident Investigative Process at K.c. Zoo	Jan 18
Grass Roots Genetics ...Animal Breeding	Mar 86
...Pedigrees	Ap 112
Mammal Anticipatory Chart	Ju 178
Training Experiences at the Jersey Wildlife Preservation Trust	Oct 320
Beneficial Aspects of Photographic Documentation of Captive Wildlife by Animal Keepers	Dec 379
Historical Changes in Zoological Development	Dec 398
How I Spent My Summer Vacation	Dec 403
So You Want To Be A Star	Dec 406
Animals in Education	Dec 408
Artificial Incubation of Bird Eggs	Dec 418

RESEARCH

Captive Elephant Management Program Survey	Jan 31
A Case Study of Urinary Tract Problems In a Male Cheetah	Feb 44
Hillkeeper Peepers or Urine-for-Life (a Fine Art)	Feb 53
Echidna Study at the Topeka Zoo	Mar 95
A Guide To Getting Started in Research	May 161
Adjustment Process of African Elephants to a Novel Situation	Jul 207
A Handmade Blowgun Dart: Its Preparation and Application in a Zoological Park	Aug 242
Care and Reproduction of the Giant Day Gecko	Aug 248
The Digit Fund--Will the Mountain Gorilla Survive?	Sep 287
Beneficial Aspects of Photographic Documentation of Captive Wildlife by Animal Keepers	Dec 379
Maternal Behavior and Infant Development of the Lowland Gorilla at Metro Toronto Zoo	Dec 387
The Birth and Development of the Lar or Whaita Handed Gibbon	Dec 392
<i>Coendou prehensilis</i> : A Comparison to Other New and Old World Porcupines	Dec 410

CONSERVATION

Hillkeeper Peepers or Urine-for-Life (A Fine Art)	Feb 53
Captive Rearing of Barn Owls at the Memphis Zoo	Mar 73
Summary of Events of the 1983 Giant Panda Breeding Season at NZP	May 159
Why Save Bats?	Aug 246
Successes Outweigh Death of Cub During 1983 Panda Breeding Season at NZP	Sep 281
The Digit Fund--Will the Mountain Gorilla Survive?	Sep 287
The College of African Wildlife Management	Nov 343

EXHIBIT DESIGN

Building a Safe, Long-term Elephant Breeding Facility at Calgary Zoo	Jan 25
National Zoological Park to Open Monkey Island Paradise	Feb 55
The Use of Clear Strip Curtains as Weather Barriers for Zoo Animals	Mar 78
A New Home for Tamarins at the Greater Baton Rouge Zoo	Ap 109
Readapting a Tropical Species to the Tropics	Dec 370
From Giraffes to Tree Kangaroos	Dec 430
Renovation: Bringing a Zoo's Past Into the Present	Dec 435

MISCELLANEOUS

Springfield Hosts National Elephant Seminar	Jan 36
Policy Is The Best Policy	Mar 164
A Second Look At Africa	Ju 189
A Unique Zoo in Chipas, Mexico	Jul 215
A Zoological Garden With Nature As Its Director	Aug 242
Forming a Chapter at Lafayette Zoological Park	Sep 279
Training Experiences at the Jersey Wildlife Preservation Trust	Oct 320
The College of African Wildlife Management	Nov 343

MISCELLANEOUS, (continued)

Using Empathy As A Tool in Animal Care	Dec 366
Talking Zookeeper Blues (Reprise)	Dec 374
Zookeeping Girl	Dec 375
Historical Changes in Zoological Management	Dec 398
How I Spent My Summer Vacation	Dec 403
So You Want To Be A Star	Dec 406
What's New at the Zoo? (A History of Washington Park Zoo)	Dec 426



AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

_____ \$20.00 Professional
Full-time Keepers and
International Members

_____ \$10.00 Associate
Individuals not connected
with an animal care facility

_____ \$15.00 Affiliate
Other staff and volunteers

_____ \$50.00 Contributing
Organizations and individuals

U.S. CURRENCY ONLY PLEASE

Directory Information

Zoo _____ Work Area _____ Special Interests _____

Mail this application and check or money order, payable to American Association of Zoo Keepers, to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to the *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada

INFORMATION FOR CONTRIBUTORS



Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size of no more than 6" x 10" (15 cm x 25½ cm.). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephoned contributions on late-breaking news or last minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or of the American Association of Zoo Keepers.

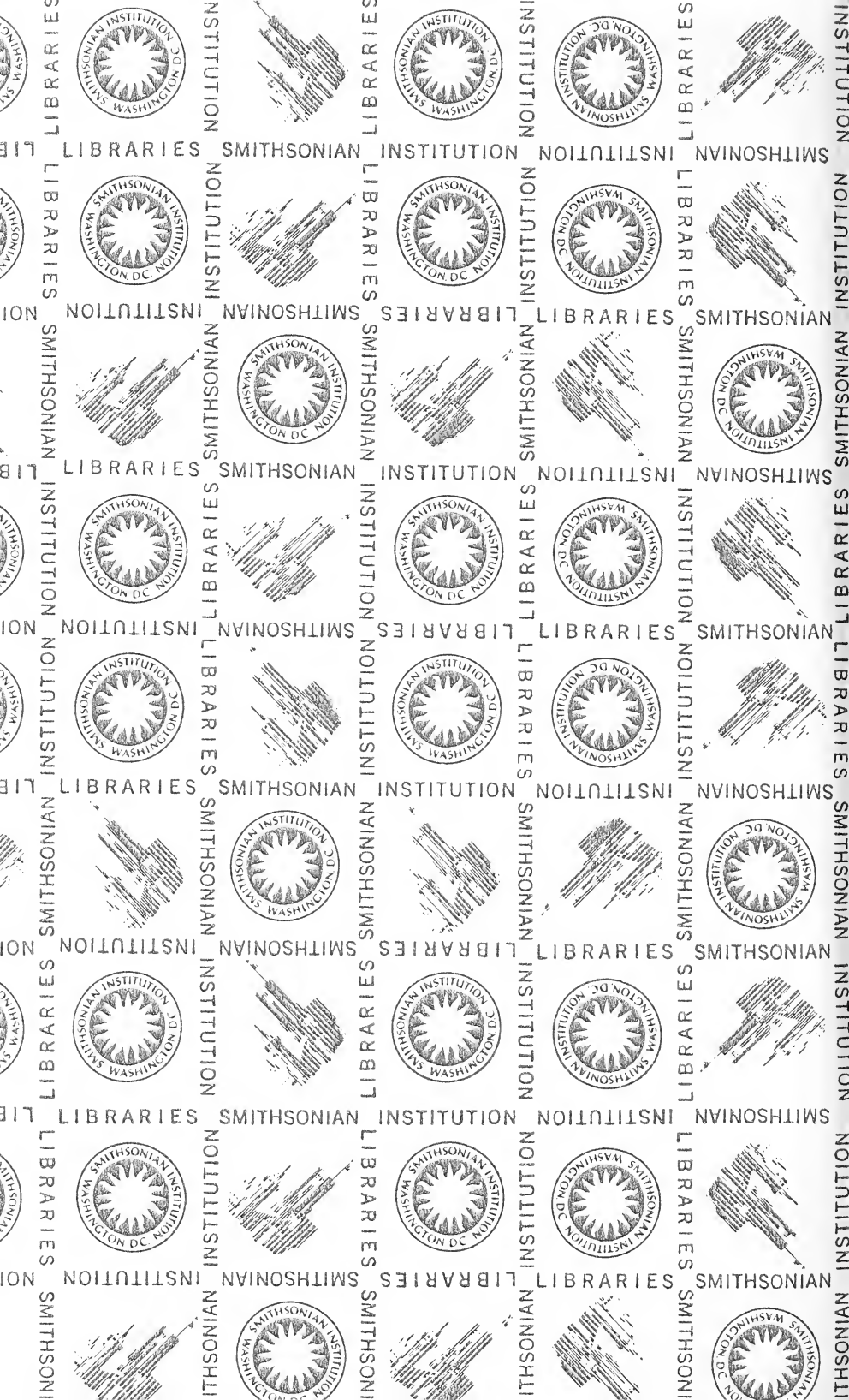
Items in the publication may be reprinted. Credit to this publication is requested. Order reprints from the Editor.

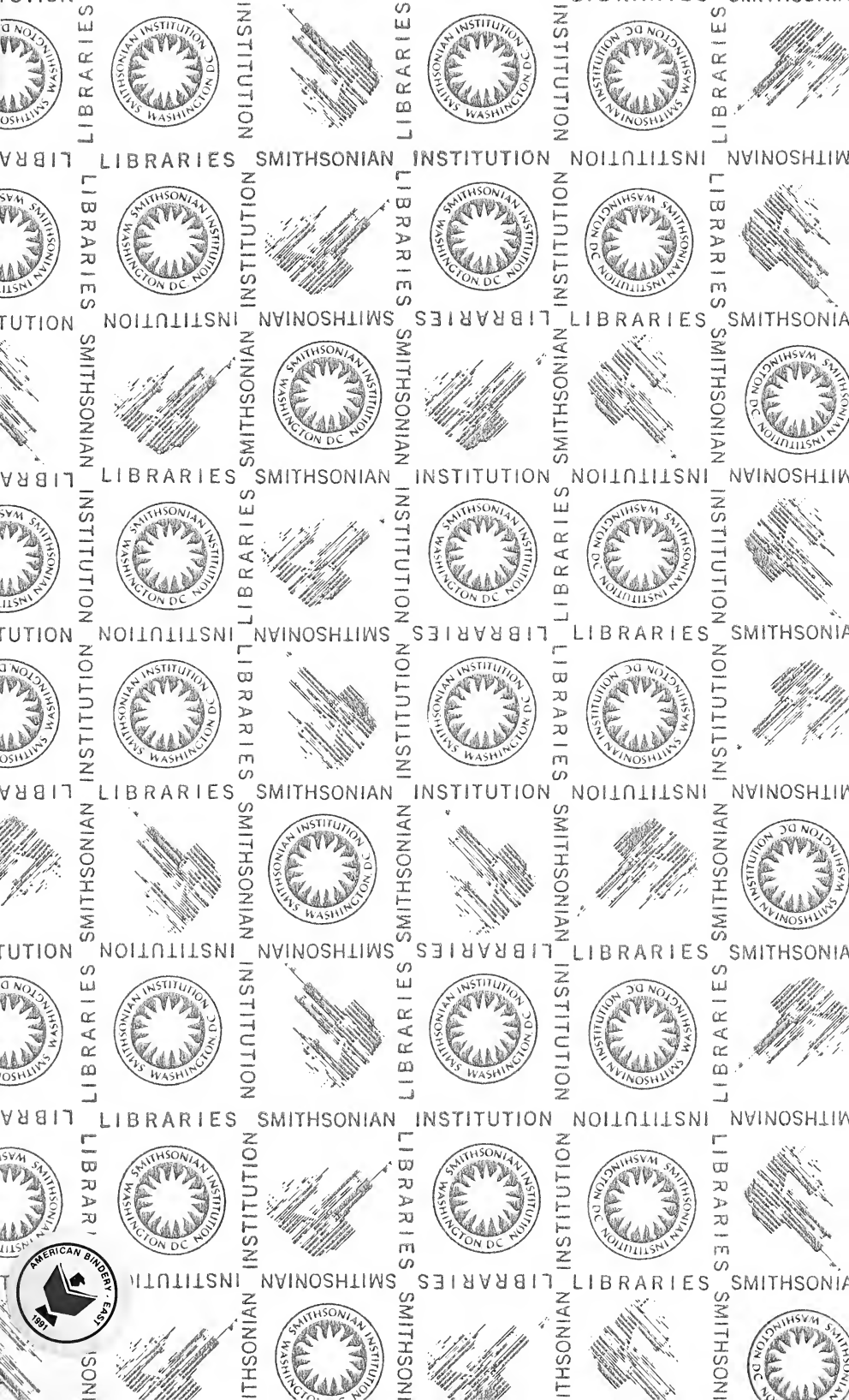
**American Association
of Zoo Keepers
Topeka Zoological Park
635 Gage Blvd.
Topeka, KS 66606**

Second Class
Postage Paid At Topeka









SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01062 5770